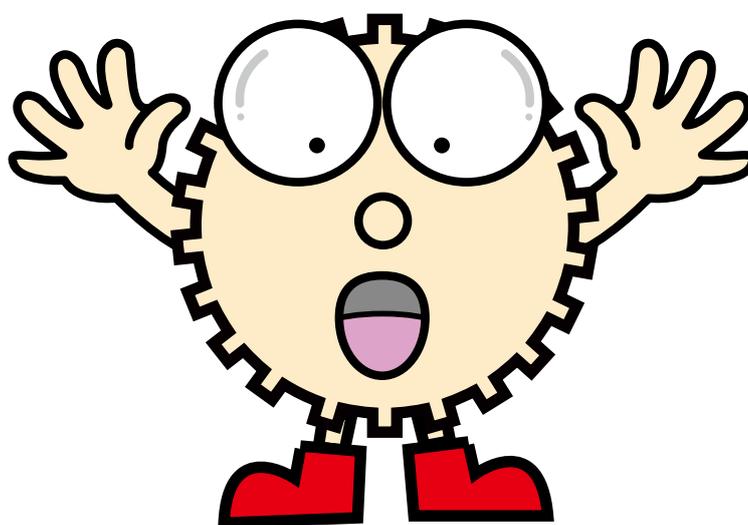




Screw Gears

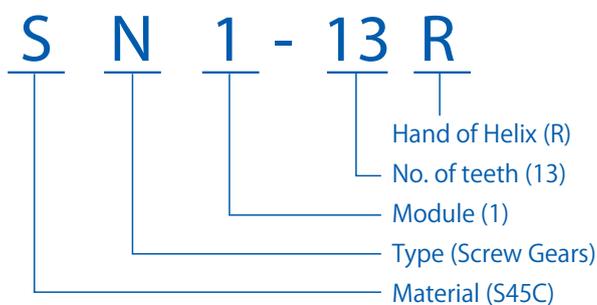
SN Steel Screw Gears  <i>Newly added</i> m1 ~ 4 Page 328 	SUN Stainless Steel Screw Gears  m1 ~ 3 Page 332 	AN Aluminum-Bronze Screw Gears  m1 ~ 4 Page 334 	PN Plastic Screw Gears  m1.5 ~ 3 Page 336 
---	--	---	---



Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Screw Gears



Material

S	S45C
SU	SUS303
A	CAC702
P	MC901

Type

N	Screw Gears
---	-------------

Feature Icons

RoHS Compliant Product	Finished Product	Ground Gear	Resin Product	Injection Molded Product
Re-machinable Product	Heat Treated Product	Stainless Product	Copper Alloy Product	Black Oxide coated Product

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Screw Gears

Characteristics



KHK stock screw gears come in four materials, S45C, SUS303, CAC702 (formerly Al BC2) and MC nylon, in modules 1 ~ 4 and numbers of teeth from 10 to 30.

Catalog No.	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1702-1:1998	Secondary Operations	Features
SN	1 ~ 4	S45C	—	Cut	N9	○	Popular screw gears. Additionally, gear tooth induction hardening secondary operations can be performed.
SUN	1 ~ 3	SUS303	—	Cut	N9	○	Suitable for food machinery due to SUS303's rust resistant qualities.
AN	1 ~ 4	CAC702 (Al BC2)	—	Cut	N9	○	Aluminum bronze made products have excellent wear resistance.
PN	1.5 ~ 3	MC901	—	Cut	N9	○	Light-weight products made of MC Nylon can be used without lubrication.

○ Possible △ Partly possible × Not possible

Selection Hints

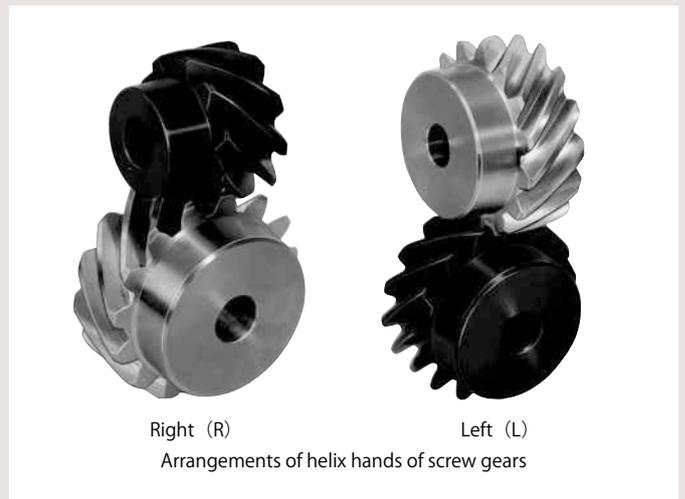


Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection. Since screw gears come in right- or left-hand helix, make sure to include the letter "R" or "L" in the catalog number when you order.

1. Caution in Selecting the Mating Gears

Screw gears are used for offset shafts. Whether the shafts are paralleled offset or skewed offset depends on the helix hands of the mating gears.

Direction of shaft	Arrangement of helix hands
Skewed shafts	RH-RH or LH-LH
Parallel shafts	RH-LH



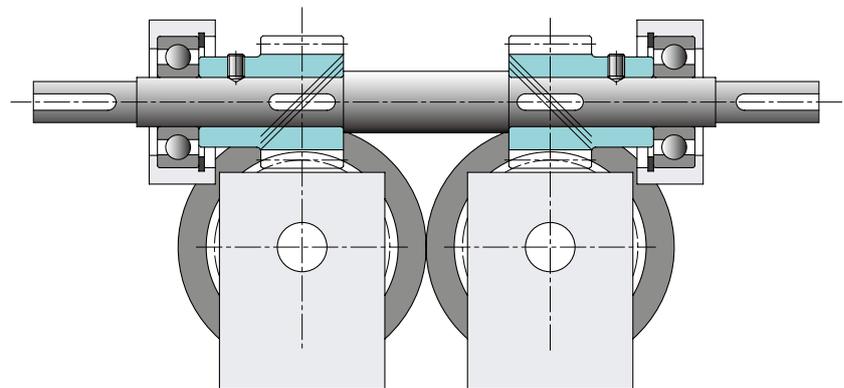
Trusted quality achieved by years of experience.

Efficient production by lapping cutting processes.



Gear cutting by a Hobbing Machine

Application Example



Feed by rollers * (It rotates 2 rollers by one input shaft.)

* The illustration above is a design example, not a design for machinery or a device in actual use.

Application Hints



2. Caution in Selecting Gears Based on Gear Strength

The allowable surface strength listed in the product pages were derived using the Niemann formula as reference values (for the case of skewed offset shafts).

There is paucity of data on the strength of screw gears. The values of constant K_0 used in the calculations, which depend on the material of the mating gears, are our estimates. The mathematic expression below shows the Niemann formula to determine allowable tangential force F_t (kgf) and allowable torque T (kgf, m) on a basic circle.

$$F_t = 1.43d_1^2 f_z K_s$$

$$T = \frac{F_t d_1}{2000}$$

Where

d_1 : standard pitch diameter of pinion (mm)

f_z : coefficient based on no. of teeth combination

K_s : coefficient based on materials and sliding

$$K_s = K_0 \frac{2}{2 + V_s}$$

Where

K_0 : coefficient based on material selection

V_s : sliding speed (m/s)

$$V_s = \frac{\pi n d_1}{60000 \cos \beta}$$

Where

n : rotation (rpm)

β : helix angle (45°)

Value of f_z

$Z_2 \backslash Z_1$	10	13	15	20	26	30
10	1.538					
13	2.005	1.538				
15	2.279	1.786	1.538			
20	2.963	2.329	2.053	1.538		
26	3.695	2.963	2.588	2.005	1.538	
30	4.161	3.350	2.963	2.279	1.786	1.538

K_0 values depending on material combination

Catalog No.	Mating gear	K_0	The maximum allowable sliding speed m/s	No. of teeth of mating gears	Rotation
SN	SN	0.0030	2.5	Same no. of teeth	100rpm
SUN	SN	0.0030 <small>Note 1</small>	2.5 <small>Note 1</small>		
AN	SN	0.0050	5		
PN	SN	0.0030 <small>Note 1</small> (0.0021)	2.5 <small>Note 1</small> (1.0)		

[NOTE 1] K_0 values and the maximum allowable sliding speed of SUN PN products are set by KHK. Screw gears are basically used with lubrication. In case of using PN products without lubrication, the parenthetical values shown in the table are applied.

In order to use KHK stock screw gears safely, read the Application Hints carefully before proceeding. Also, please refer to the "Application Hints" in the technical information section on KHK stock spur gears (Page 32) when performing secondary operations.

1. Points of Caution in Assembling

- ① KHK stock screw gears are designed to give the proper backlash when assembled using the center distance given by the formula below with a tolerance of H7 to H8. The amount of backlash is given in the product table for each gear.

$$a = \frac{d_1 + d_2}{2}$$

Where

a : Center distance

d_1 : Pitch diameter of pinion

d_2 : Pitch diameter of gear

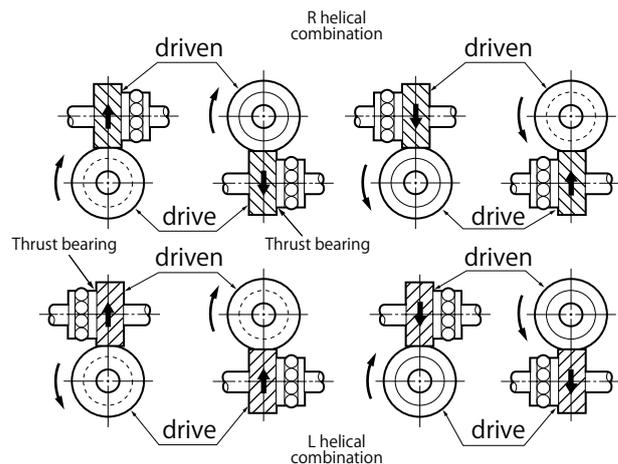
- ② Overall length tolerance of Screw Gears

Total Length (mm)	Tolerance
up to 30	0 - 0.10
30 up to 100	0 - 0.15

[CAUTION] PN Plastic Screw Gears are excluded.

- ③ Due to the helix of screw gears, they produce axial thrust forces. The bearings must be selected properly to be able to handle these thrust forces. The directions of thrust changes with the hand of helix and the direction of rotation as illustrated below.

Direction of rotation and thrust force

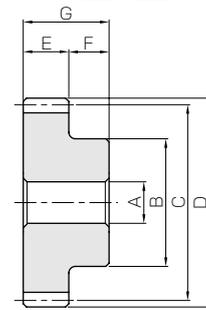


[CAUTION] For parallel shaft applications, see the Application Hints for KHK Helical Gears. (Page 167).



Specifications			
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)		
Reference section of gear	Normal plane		
Gear teeth	Standard full depth		
Normal pressure angle	20°		
Helix angle	45°		
Material	S45C		
Heat treatment	—		
Module	m1	m1.5	m2
Face width (E)	10	15	20
Hub width (F)	10	10	15
Total length (G)	20	25	35
Screw offset (J)	5	5	7.5

* The precision grade of J Series products is equivalent to the value shown in the table.



S1

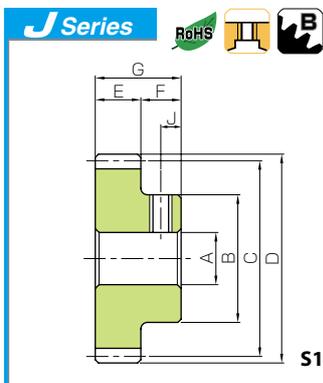
Catalog No.	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)
				A _{H7}	B	C	D	Surface durability	Surface durability		
SN1-13R SN1-13L	13	R L	S1	6	15	18.38	20.38	0.19	0.019	0.08~0.18	0.030
SN1-15R SN1-15L	15	R L	S1	6	18	21.21	23.21	0.29	0.029	0.08~0.18	0.043
SN1-20R SN1-20L	20	R L	S1	8	25	28.28	30.28	0.66	0.068	0.08~0.18	0.080
SN1-26R SN1-26L	26	R L	S1	10	30	36.77	38.77	1.42	0.14	0.10~0.22	0.130
SN1-30R SN1-30L	30	R L	S1	10	35	42.43	44.43	2.14	0.22	0.10~0.22	0.170
SN1.5-10R SN1.5-10L	10	R L	S1	8	16	21.21	24.21	0.29	0.029	0.08~0.20	0.048
SN1.5-13R SN1.5-13L	13	R L	S1	10	23	27.58	30.58	0.62	0.063	0.10~0.22	0.088
SN1.5-15R SN1.5-15L	15	R L	S1	10	25	31.82	34.82	0.93	0.095	0.10~0.22	0.120
SN1.5-20R SN1.5-20L	20	R L	S1	12	30	42.43	45.43	2.14	0.22	0.10~0.22	0.200
SN1.5-26R SN1.5-26L	26	R L	S1	12	40	55.15	58.15	4.51	0.46	0.12~0.26	0.360
SN1.5-30R SN1.5-30L	30	R L	S1	12	45	63.64	66.64	6.75	0.69	0.12~0.26	0.480
SN2-10R SN2-10L	10	R L	S1	12	22	28.28	32.28	0.66	0.068	0.10~0.22	0.110
SN2-13R SN2-13L	13	R L	S1	12	30	36.77	40.77	1.42	0.14	0.12~0.26	0.220
SN2-15R SN2-15L	15	R L	S1	12	35	42.43	46.43	2.14	0.22	0.12~0.26	0.300
SN2-20R SN2-20L	20	R L	S1	15	45	56.57	60.57	4.84	0.49	0.12~0.26	0.530
SN2-26R SN2-26L	26	R L	S1	20	60	73.54	77.54	10.1	1.03	0.14~0.30	0.910
SN2-30R SN2-30L	30	R L	S1	20	65	84.85	88.85	15.0	1.53	0.14~0.30	1.190

[Caution on Product Characteristics]

- ① When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 327 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See Page 326 for more details.
- ⑤ If the bore diameter is less than $\phi 4$, then the bore tolerance class is H8. If the bore diameter is $\phi 5$ or $\phi 6$, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 32) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.



Steel Screw Gears

Newly added



To order J Series products, please specify; **Catalog No. + J + BORE**

* The product shapes of J Series items are identified by background color.

Bore H7	* The product shapes of J Series items are identified by background color.																
Keyway Js9	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35
Screw size	—		4 × 1.8		5 × 2.3				6 × 2.8			8 × 3.3		10 × 3.3			
Catalog No.	M4	M5	M4				M5			M6		M8					
SN1-13R J BORE																	
SN1-13L J BORE																	
SN1-15R J BORE																	
SN1-15L J BORE																	
SN1-20R J BORE																	
SN1-20L J BORE																	
SN1-26R J BORE																	
SN1-26L J BORE																	
SN1-30R J BORE																	
SN1-30L J BORE																	
SN1.5-10R J BORE																	
SN1.5-10L J BORE																	
SN1.5-13R J BORE																	
SN1.5-13L J BORE																	
SN1.5-15R J BORE																	
SN1.5-15L J BORE																	
SN1.5-20R J BORE																	
SN1.5-20L J BORE																	
SN1.5-26R J BORE																	
SN1.5-26L J BORE																	
SN1.5-30R J BORE																	
SN1.5-30L J BORE																	
SN2-10R J BORE																	
SN2-10L J BORE																	
SN2-13R J BORE																	
SN2-13L J BORE																	
SN2-15R J BORE																	
SN2-15L J BORE																	
SN2-20R J BORE																	
SN2-20L J BORE																	
SN2-26R J BORE																	
SN2-26L J BORE																	
SN2-30R J BORE																	
SN2-30L J BORE																	

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

* For products not categorized in our KHK Stock Gear series, custom gear production services with short lead times is available. For details see page 8.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

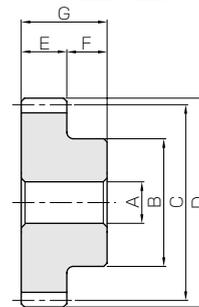
Other Products



Steel Screw Gears



Specifications			
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)		
Reference section of gear	Normal plane		
Gear teeth	Standard full depth		
Normal pressure angle	20°		
Helix angle	45°		
Material	S45C		
Heat treatment	—		
Module	m2.5	m3	m4
Face width (E)	22	25	30
Hub width (F)	16	18	20
Total length (G)	38	43	50
Screw offset (J)	8	9	10



S1

* The precision grade of J Series products is equivalent to the value shown in the table.

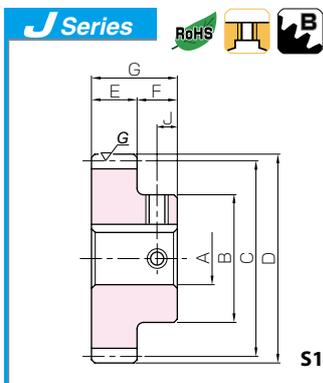
Catalog No.	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)
				A _{H7}	B	C	D	Surface durability	Surface durability		
SN2.5-10R SN2.5-10L	10	R L	S1	12	26	35.36	40.36	1.27	0.13	0.12~0.24	0.20
SN2.5-13R SN2.5-13L	13	R L		15	35	45.96	50.96	2.68	0.27		
SN2.5-15R SN2.5-15L	15	R L			40	53.03	58.03	4.03	0.41		
SN2.5-20R SN2.5-20L	20	R L		20	60	70.71	75.71	9.07	0.92	0.16~0.34	0.94
SN2.5-26R SN2.5-26L	26	R L			70	91.92	96.92	18.8	1.91		
SN2.5-30R SN2.5-30L	30	R L			80	106.07	111.07	27.7	2.83		
SN3-10R SN3-10L	10	R L		15	34	42.43	48.43	2.14	0.22	0.12~0.26	0.35
SN3-13R SN3-13L	13	R L		50	45	55.15	61.15	4.51	0.46	0.14~0.32	0.59
SN3-15R SN3-15L	15	R L			50	63.64	69.64	6.75	0.69		
SN3-20R SN3-20L	20	R L			60	84.85	90.85	15.0	1.53		
SN3-26R SN3-26L	26	R L		80	80	110.31	116.31	30.8	3.14	0.18~0.38	2.48
SN3-30R SN3-30L	30	R L			90	127.28	133.28	45.4	4.62		
SN4-10R SN4-10L	10	R L			20	45	56.57	64.57	4.84		
SN4-13R SN4-13L	13	R L		60		73.54	81.54	10.1	1.03	0.18~0.38	1.32
SN4-15R SN4-15L	15	R L		70		84.85	92.85	15.0	1.53		
SN4-20R SN4-20L	20	R L		90		113.14	121.14	33.0	3.37		
SN4-26R SN4-26L	26	R L	100	100		147.08	155.08	66.7	6.80	0.20~0.44	5.11
SN4-30R SN4-30L	30	R L		110		169.71	177.71	97.1	9.91		

[Caution on Product Characteristics]

- When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 327 for more details.
- The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See Page 326 for more details.
- If the bore diameter is less than $\varphi 4$, then the bore tolerance class is H8. If the bore diameter is $\varphi 5$ or $\varphi 6$, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 32) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.



Steel Screw Gears

Newly added



To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7																	
Keyway Js9	12	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50	
Screw size	4 x 1.8				6 x 2.8				8 x 3.3			10 x 3.3		12 x 3.3		14 x 3.8	
Catalog No.	M4				M5				M6			M8		M10			
SN2.5-10R J BORE																	
SN2.5-10L J BORE																	
SN2.5-13R J BORE																	
SN2.5-13L J BORE																	
SN2.5-15R J BORE																	
SN2.5-15L J BORE																	
SN2.5-20R J BORE																	
SN2.5-20L J BORE																	
SN2.5-26R J BORE																	
SN2.5-26L J BORE																	
SN2.5-30R J BORE																	
SN2.5-30L J BORE																	
SN3-10R J BORE																	
SN3-10L J BORE																	
SN3-13R J BORE																	
SN3-13L J BORE																	
SN3-15R J BORE																	
SN3-15L J BORE																	
SN3-20R J BORE																	
SN3-20L J BORE																	
SN3-26R J BORE																	
SN3-26L J BORE																	
SN3-30R J BORE																	
SN3-30L J BORE																	
SN4-10R J BORE																	
SN4-10L J BORE																	
SN4-13R J BORE																	
SN4-13L J BORE																	
SN4-15R J BORE																	
SN4-15L J BORE																	
SN4-20R J BORE																	
SN4-20L J BORE																	
SN4-26R J BORE																	
SN4-26L J BORE																	
SN4-30R J BORE																	
SN4-30L J BORE																	

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

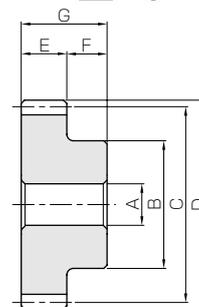
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	SUS303
Heat treatment	—



S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A _{H7}	B	C	D	E	F	G
SUN1-13R SUN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20
SUN1-15R SUN1-15L		15	R L	S1	6	18	21.21	23.21	10	10	20
SUN1.5-10R SUN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25
SUN1.5-13R SUN1.5-13L		13	R L	S1	10	23	27.58	30.58	15	10	25
SUN1.5-15R SUN1.5-15L		15	R L	S1	10	25	31.82	34.82	15	10	25
SUN1.5-20R SUN1.5-20L		20	R L	S1	12	30	42.43	45.43	15	10	25
SUN2-10R SUN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35
SUN2-13R SUN2-13L		13	R L	S1	12	30	36.77	40.77	20	15	35
SUN2-15R SUN2-15L		15	R L	S1	12	35	42.43	46.43	20	15	35
SUN2-20R SUN2-20L		20	R L	S1	15	45	56.57	60.57	20	15	35
SUN2.5-10R SUN2.5-10L	m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38
SUN2.5-13R SUN2.5-13L		13	R L	S1	15	35	45.96	50.96	22	16	38
SUN2.5-15R SUN2.5-15L		15	R L	S1	15	40	53.03	58.03	22	16	38
SUN2.5-20R SUN2.5-20L		20	R L	S1	20	60	70.71	75.71	22	16	38
SUN3-10R SUN3-10L	m3	10	R L	S1	15	34	42.43	48.43	25	18	43
SUN3-13R SUN3-13L		13	R L	S1	20	45	55.15	61.15	25	18	43
SUN3-15R SUN3-15L		15	R L	S1	20	50	63.64	69.64	25	18	43
SUN3-20R SUN3-20L		20	R L	S1	20	60	84.85	90.85	25	18	43

[Caution on Product Characteristics]

- ① When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 327 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See Page 326 for more details.
- ⑤ If the bore diameter is less than $\phi 4$, then the bore tolerance class is H8. If the bore diameter is $\phi 5$ or $\phi 6$, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.19	—	0.019	0.08~0.18	0.030	SUN1-13R SUN1-13L
—	0.29	—	0.029	0.08~0.18	0.043	SUN1-15R SUN1-15L
—	0.29	—	0.029	0.08~0.20	0.047	SUN1.5-10R SUN1.5-10L
—	0.62	—	0.063	0.10~0.22	0.087	SUN1.5-13R SUN1.5-13L
—	0.93	—	0.095	0.10~0.22	0.12	SUN1.5-15R SUN1.5-15L
—	2.14	—	0.22	0.10~0.22	0.20	SUN1.5-20R SUN1.5-20L
—	0.66	—	0.068	0.10~0.22	0.11	SUN2-10R SUN2-10L
—	1.42	—	0.14	0.12~0.26	0.22	SUN2-13R SUN2-13L
—	2.14	—	0.22	0.12~0.26	0.30	SUN2-15R SUN2-15L
—	4.84	—	0.49	0.12~0.26	0.53	SUN2-20R SUN2-20L
—	1.27	—	0.13	0.12~0.24	0.20	SUN2.5-10R SUN2.5-10L
—	2.68	—	0.27	0.14~0.28	0.35	SUN2.5-13R SUN2.5-13L
—	4.03	—	0.41	0.14~0.28	0.48	SUN2.5-15R SUN2.5-15L
—	9.07	—	0.92	0.14~0.28	0.93	SUN2.5-20R SUN2.5-20L
—	2.14	—	0.22	0.12~0.26	0.34	SUN3-10R SUN3-10L
—	4.51	—	0.46	0.14~0.32	0.58	SUN3-13R SUN3-13L
—	6.75	—	0.69	0.14~0.32	0.79	SUN3-15R SUN3-15L
—	15.04	—	1.53	0.14~0.32	1.39	SUN3-20R SUN3-20L

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 32) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

GCU-N Screw Gear Kit



Installment : Nonparallel and nonintersecting gears
Gear Type : Screw Gears
Gears : SN2.5-10R
PN2.5-10R
Gear Ratio : 1
Weight : Approx. 1kg

Screw Gears are helical gears used in nonparallel and nonintersecting situations. Applications include devices like conveyers with light loads.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

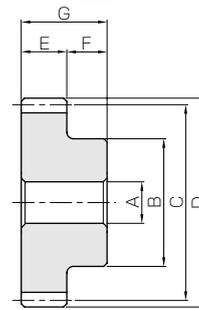
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	CAC702 (formerly JIS A/BC2)
Heat treatment	—



S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A _{H7}	B	C	D	E	F	G
AN1-13R AN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20
AN1-15R AN1-15L		15	R L	S1	6	18	21.21	23.21	10	10	20
AN1.5-10R AN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25
AN1.5-13R AN1.5-13L		13	R L	S1	10	23	27.58	30.58	15	10	25
AN1.5-15R AN1.5-15L		15	R L	S1	10	25	31.82	34.82	15	10	25
AN2-10R AN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35
AN2-13R AN2-13L		13	R L	S1	12	30	36.77	40.77	20	15	35
AN2-15R AN2-15L		15	R L	S1	12	35	42.43	46.43	20	15	35
AN2.5-10R AN2.5-10L	m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38
AN2.5-13R AN2.5-13L		13	R L	S1	15	35	45.96	50.96	22	16	38
AN2.5-15R AN2.5-15L		15	R L	S1	15	40	53.03	58.03	22	16	38
AN3-10R AN3-10L	m3	10	R L	S1	15	34	42.43	48.43	25	18	43
AN3-13R AN3-13L		13	R L	S1	20	45	55.15	61.15	25	18	43
AN3-15R AN3-15L		15	R L	S1	20	50	63.64	69.64	25	18	43
AN4-10R AN4-10L	m4	10	R L	S1	20	45	56.57	64.57	30	20	50
AN4-13R AN4-13L		13	R L	S1	20	60	73.54	81.54	30	20	50
AN4-15R AN4-15L		15	R L	S1	20	70	84.85	92.85	30	20	50

[Caution on Product Characteristics]

- ① When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 327 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears ~ for parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See Page 326 for more details.
- ⑤ If the bore diameter is less than $\varphi 4$, then the bore tolerance class is H8. If the bore diameter is $\varphi 5$ or $\varphi 6$, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.31	—	0.032	0.08~0.18	0.029	AN1-13R AN1-13L
—	0.48	—	0.049	0.08~0.18	0.042	AN1-15R AN1-15L
—	0.48	—	0.049	0.08~0.20	0.046	AN1.5-10R AN1.5-10L
—	1.03	—	0.10	0.10~0.22	0.085	AN1.5-13R AN1.5-13L
—	1.55	—	0.16	0.10~0.22	0.11	AN1.5-15R AN1.5-15L
—	1.10	—	0.11	0.10~0.22	0.11	AN2-10R AN2-10L
—	2.36	—	0.24	0.12~0.26	0.21	AN2-13R AN2-13L
—	3.56	—	0.36	0.12~0.26	0.29	AN2-15R AN2-15L
—	2.11	—	0.22	0.12~0.24	0.20	AN2.5-10R AN2.5-10L
—	4.47	—	0.46	0.14~0.28	0.34	AN2.5-13R AN2.5-13L
—	6.72	—	0.69	0.14~0.28	0.47	AN2.5-15R AN2.5-15L
—	3.56	—	0.36	0.12~0.26	0.34	AN3-10R AN3-10L
—	7.51	—	0.77	0.14~0.32	0.57	AN3-13R AN3-13L
—	11.3	—	1.15	0.14~0.32	0.77	AN3-15R AN3-15L
—	8.07	—	0.82	0.16~0.34	0.70	AN4-10R AN4-10L
—	16.9	—	1.72	0.18~0.38	1.28	AN4-13R AN4-13L
—	25.1	—	2.56	0.18~0.38	1.75	AN4-15R AN4-15L

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 32) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

GCU-N Screw Gear Kit



Installment : Nonparallel and nonintersecting gears
 Gear Type : Screw Gears
 Gears : SN2.5-10R
 PN2.5-10R
 Gear Ratio : 1
 Weight : Approx. 1kg

Screw Gears are helical gears used in nonparallel and nonintersecting situations. Applications include devices like conveyers with light loads.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

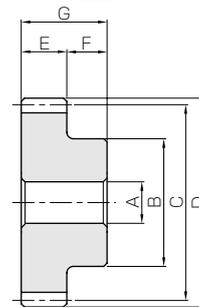
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	MC901
Heat treatment	—

* The precision grade of this product is equivalent to the value shown in the table.



S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A	B					
PN1.5-10R PN1.5-10L	m1.5	10	R L	S1	6	16	21.21	24.21	15	10	25
PN1.5-13R PN1.5-13L		13	R L	S1	8	23	27.58	30.58	15	10	25
PN1.5-15R PN1.5-15L		15	R L	S1	8	25	31.82	34.82	15	10	25
PN1.5-20R PN1.5-20L		20	R L	S1	10	30	42.43	45.43	15	10	25
PN2-10R PN2-10L	m2	10	R L	S1	10	22	28.28	32.28	20	15	35
PN2-13R PN2-13L		13	R L	S1	10	30	36.77	40.77	20	15	35
PN2-15R PN2-15L		15	R L	S1	10	35	42.43	46.43	20	15	35
PN2-20R PN2-20L		20	R L	S1	12	45	56.57	60.57	20	15	35
PN2.5-10R PN2.5-10L	m2.5	10	R L	S1	10	26	35.36	40.36	22	16	38
PN2.5-13R PN2.5-13L		13	R L	S1	12	35	45.96	50.96	22	16	38
PN2.5-15R PN2.5-15L		15	R L	S1	12	40	53.03	58.03	22	16	38
PN2.5-20R PN2.5-20L		20	R L	S1	12	60	70.71	75.71	22	16	38
PN3-10R PN3-10L	m3	10	R L	S1	12	34	42.43	48.43	25	18	43
PN3-13R PN3-13L		13	R L	S1	15	45	55.15	61.15	25	18	43
PN3-15R PN3-15L		15	R L	S1	15	50	63.64	69.64	25	18	43
PN3-20R PN3-20L		20	R L	S1	15	60	84.85	90.85	25	18	43

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), teeth diameter, and backlash. Please see the section "Design of Plastic Gears" in separate technical reference book. (Page 101).
- ② When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 327 for more details.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ⑤ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See Page 326 for more details.

* In regards to MC Nylon gears, other materials are available for plastic gears, including Ultra High Molecular Weight Polyethylene (UHMW-PE), which has excellent abrasion resistance. Poly Ether Ether Ketone (PEEK) also has quality properties. A single piece order is acceptable and will be produced as a custom-made gear. For details on quotations and orders please see Page 8.

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.29	—	0.029	0~0.38	0.0077	PN1.5-10R PN1.5-10L
—	0.62	—	0.063	0~0.38	0.014	PN1.5-13R PN1.5-13L
—	0.93	—	0.095	0~0.38	0.018	PN1.5-15R PN1.5-15L
—	2.14	—	0.22	0~0.38	0.031	PN1.5-20R PN1.5-20L
—	0.66	—	0.068	0~0.42	0.018	PN2-10R PN2-10L
—	1.42	—	0.14	0~0.42	0.034	PN2-13R PN2-13L
—	2.14	—	0.22	0~0.42	0.046	PN2-15R PN2-15L
—	4.84	—	0.49	0~0.44	0.081	PN2-20R PN2-20L
—	1.27	—	0.13	0~0.44	0.031	PN2.5-10R PN2.5-10L
—	2.68	—	0.27	0~0.44	0.055	PN2.5-13R PN2.5-13L
—	4.03	—	0.41	0~0.46	0.075	PN2.5-15R PN2.5-15L
—	9.07	—	0.92	0~0.46	0.15	PN2.5-20R PN2.5-20L
—	2.14	—	0.22	0~0.52	0.054	PN3-10R PN3-10L
—	4.51	—	0.46	0~0.54	0.094	PN3-13R PN3-13L
—	6.75	—	0.69	0~0.54	0.12	PN3-15R PN3-15L
—	15.0	—	1.53	0~0.54	0.21	PN3-20R PN3-20L

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 32) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.
- ③ Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

GCU-N Screw Gear Kit



Installment : Nonparallel and
nonintersecting gears
Gear Type : Screw Gears
Gears : SN2.5-10R
PN2.5-10R
Gear Ratio : 1
Weight : Approx. 1kg

Screw Gears are helical gears used in nonparallel and nonintersecting situations. Applications include devices like conveyers with light loads.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

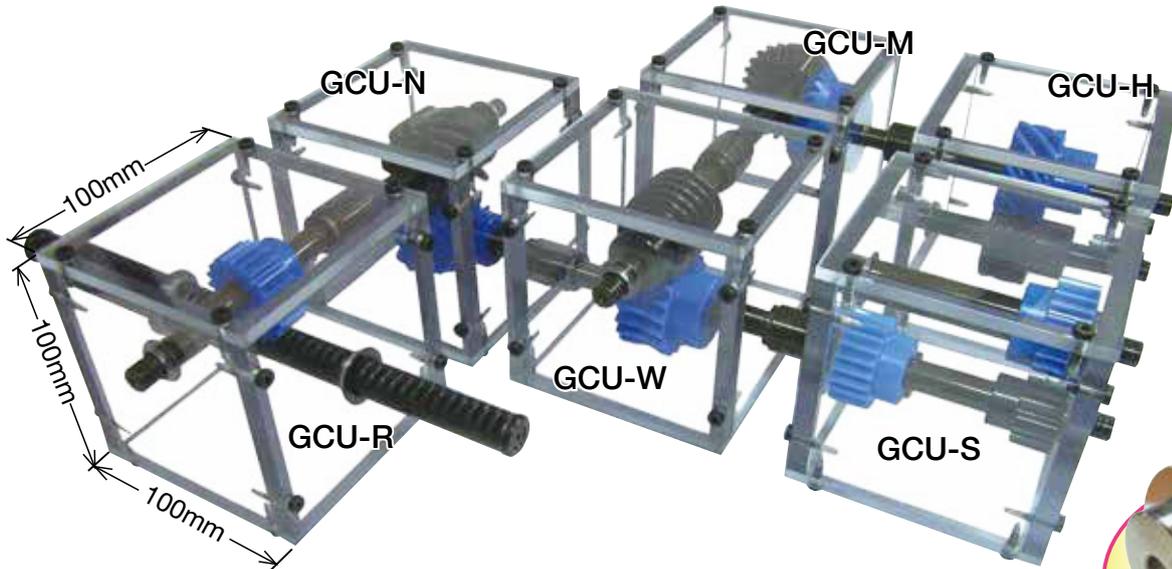
Bevel Gearboxes

Other Products

GCU
Gear Assembly Kit (For use in learning about gears)

Knockdown style

 RoHS Compliant



GCU-N Screw Gear Kit



Installment : Nonparallel and nonintersecting gears
 Gear Type : Screw Gears
 Gears : SN2.5-10R
 PN2.5-10R
 Gear Ratio : 1
 Weight : Approx. 1kg

Screw Gears are helical gears used in nonparallel and nonintersecting situations. Applications include devices like conveyers with light loads.

Six items available in total

GCU-S Spur Gear Kit



Installment : Parallel axes gears (Two-stage)
 Gear Type : Spur Gears
 Gears : 2 units of SS1.5-16
 2 units of PS1.5-22
 Gear Ratio : 1.89
 Weight : Approx. 1kg

The Gear Kit contains two-stage spur gears and allows speed increases / reductions, and includes the most commonly used combinations of gears.

GCU-H Helical Gear Kit



Installment : Parallel axes gears
 Gear Type : Helical Gears (Screw Gears)
 Gears : SN2.5-10L
 PN2.5-10R
 Gear Ratio : 1
 Weight : Approx. 1kg

Helical gears have more strength than spur gears of the same dimensions and have the advantage of being less noisy.

GCU-R Rack Kit



Installment : Parallel axes gears
 Gear Type : Racks & Pinions
 Gears : SR01.5-500
 PS1.5-20
 Weight : Approx. 1kg

Use of racks enables the conversion of rotation motion to linear motion. Applications include devices that provide lift.

GCU-M Miter Gear Kit



Installment : Intersecting axes gears
 Gear Type : Miter Gears
 Gears : SM2-25
 PM2-25
 Gear Ratio : 1
 Weight : Approx. 1kg

Use of Miter gears allows the changing of the shaft angle by 90 degrees. Applications include the changing of the direction of power.

GCU-W Worm Gear Pair Kit



Installment : Nonparallel and nonintersecting gears
 Gear Type : Worm Gear Pair
 Gears : SW2-R1
 PG2-20R1
 Gear Ratio : 20
 Weight : Approx. 1kg

Worm Gear Pairs can be used to make large reductions in speed in a single phase. The Worm gear cannot be driven by the worm wheel due to inherent self-locking.

* These kits are not for actual use to transmit power and please use only as representations of gear systems.



Worm Gear Pair

KWGD · KWGDLS Duplex Worms m1.5 ~ 4 Page 348 RoHS	AGDL Duplex Worm Wheels Reduction Ratio 20 ~ 60 m1.5 ~ 4 Page 348 RoHS	KWG Ground Worm Shafts m0.5 ~ 6 Page 354 RoHS	AG Worm Wheels Reduction Ratio 10 ~ 60 Newly added m0.5 ~ 1.5 Page 354 RoHS	AGF Worm Wheels Reduction Ratio 10 ~ 60 m2 ~ 6 Page 358 RoHS	SWG Ground Worms J Series m1 ~ 6 Page 364 RoHS	AG Worm Wheels Reduction Ratio 10 ~ 60 Newly added m1 ~ 6 Page 364 RoHS
SW Steel Worms J Series m0.5 ~ 6 Page 372 RoHS	BG Bronze Worm Wheels Reduction Ratio 10 ~ 60 Newly added m0.5 ~ 6 Page 372 RoHS	CG Gray Iron Worm Wheels Reduction Ratio 10 ~ 120 Newly added m1 ~ 6 Page 374 RoHS	SUW Stainless Steel Worms J Series m0.5 ~ 3 Page 388 RoHS	DG Plastic Worm Wheels Reduction Ratio 10 ~ 60 m0.5, 0.8 Page 388 RoHS	PG Plastic Worm Wheels Reduction Ratio 10 ~ 50 Newly added m1 ~ 3 Page 390 RoHS	

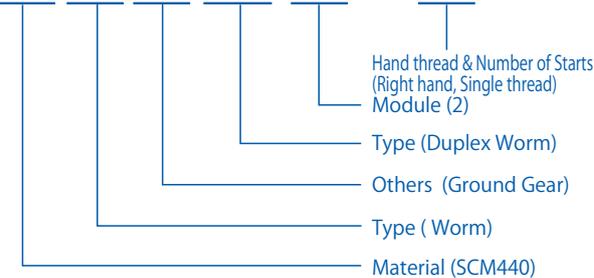
Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Worm Gear Pair

Worms

K W G DL 2 - R1



Material

K SCM440
S S45C
SU SUS303

Type

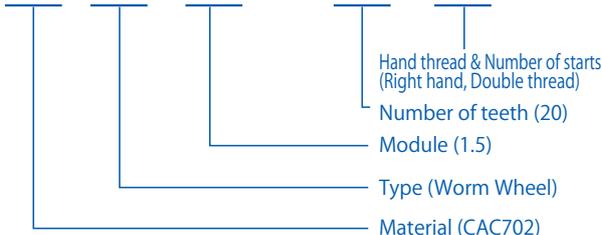
W Worms
DL Duplex Worms

Other Information

G Ground Gears
S Worm Shafts

Worm Wheels

A G 1.5 - 20 R2



Material

A CAC702(*A/BC2)
B CAC502(*PBC2)
C FC200
D Polyacetal
P MC901

Type

G Worm Wheels
GDL Duplex Worm Wheels

* () indicates old JIS designation

Feature Icons

RoHS Compliant Product	Finished Product	Ground Gear	Resin Product	Injection Molded Product
Re-machinable Product	Heat Treated Product	Stainless Product	Copper Alloy Product	Black Oxide coated Product

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Worm Gear Pair

Characteristics



The simplest way to obtain a large speed reduction with high torque in a compact space is with worm gear drives. KHK stock worms and worm wheels are available in modules 0.5 to 6 and in speed ratios of 1/10 to 1/120, made in a variety of materials and styles. We also offer stock duplex worms and worm wheels with which you can obtain a very low backlash, high rotational precision system. The following table lists the main features for easy selection.

Type	Catalog No.	Module	No. of threads or reduction ratio	Material () JIS	Heat treatment	Tooth surface finish	Precision KHK W 001 KHK W 002 NOTE 2	Features	
Duplex Worms & Worm Wheels	Worm	KWGDL	2 ~ 4	Single thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	High-precision duplex worms with superior strength. A range of backlash values can be obtained by moving the worm axially.
	Worm	KWGDLs	1.5 ~ 4	Single thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	Duplex worms with a shaft, excellent in accuracy and strength. A range of backlash values can be obtained by moving the worm axially.
	Worm Wheel	AGDL	1.5 ~ 4	20 ~ 60	CAC702 (A, B, C2)	—	Cut	1	Duplex worm wheels made of aluminum bronze, excellent in wear-resistance. The pitch accuracy is first grade.
Worms & Worm Wheels	Worm	KWG	0.5 ~ 6	Single thread - Double thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	2	Grounded finished worms with a shaft, including tooth surface quenching treatment. Allows compact design due to having small reference diameters.
	Worm Wheel	AG NOTE 1	0.5 ~ 1.5	10 ~ 60	CAC702 (A, B, C2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Wide selection is available for this item.
	Worm Wheel	AGF NOTE 1	2 ~ 6	10 ~ 60	CAC702 (A, B, C2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Allows compact design.
	Worm	SWG	1 ~ 6	Single thread - Triple thread	S45C	Gear teeth induction hardened	Ground	2	Reasonably priced ground worms. Ready-to-use finished products from the J Series, are also available.
	Worm Wheel	AG NOTE 1	1 ~ 6	10 ~ 60	CAC702 (A, B, C2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Wide selection is available for this item.
	Worm	SW	0.5 ~ 6	Single thread - Double thread	S45C	—	Cut (Thread rolled)	4	Economical, commonly used worms that have broad utility. Ready-to-use finished products from the J Series are also available.
	Worm	SUW	0.5 ~ 3	Single thread - Double thread	SUS303	—	Cut	4	Rust-resistant worms made of stainless steel suitable for mating with DS or PG worm wheels. Finished products for the J Series are also available.
	Worm Wheel	BG	0.5 ~ 6	10 ~ 60	CAC502 (PBC2)	—	Cut	4	Phosphorous bronze worm wheels have excellent wear resistance. Interchangeable with CG Worm Wheels, and enhances strength.
	Worm Wheel	CG	1 ~ 6	10 ~ 120	FC200	—	Cut	4	Economical, commonly used worm wheels that have broad utility. Available with a large selection of modules and number of teeth.
	Worm Wheel	DG	0.5 ~ 0.8	10 ~ 60	Polyacetal	—	Cut	5	Fine pitch worm wheels made of polyacetal, a stable plastic material.
Worm Wheel	PG	1 ~ 3	10 ~ 50	MC901	—	Cut	5	Light weight and strong MC Nylon worm wheels. Suitable for use in food machinery, and can be used without lubricant.	

(NOTE 1) The material of cast hubs for AGF and AG worm wheels is FC200(Cast Iron). AG worm wheels mate primarily with SWG worms. But, for Modules 0.8 or smaller, AG worm wheels mate with KWG worms.

(NOTE 2) KHK stock worms and worm wheels are produced to KHK's own precision grades. See the "Precision of Worms and Worm Wheels" in the "Selection Hints" section.

Our precision gear cutting technology enables acceleration and noise reduction

Setting the proper tooth contact and the backlash is essential for using worm gears. Use KHK stock worm gears for safe, reliable use.



Worm Grinding Machine by Klingelnberg



Worm gear testing machine by Klingelnberg

1. Efficiency of Worm Gear Pair

The efficiency of power transmission varies somewhat with the conditions of assembly and lubricant, but is generally 30 ~ 90% (excludes losses from bearings and churning of lubricants). The efficiency of KHK stock worm gear pair is given below as a reference. To learn more about strength calculations, please refer to the technical information contained in the "Surface Durability of Cylindrical Worm Gearing" section on Page 96.

■ Efficiency of KWGDLS/AGDL Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No. \ Worm rpm	100	300	600	900	1200	1800
KWGD1.5-R1	35	42	47	51	53	57
KWGD2-R1	38	45	51	55	56	61
KWGD2.5-R1	40	48	54	57	60	63
KWGD3-R1	41	49	55	58	62	65
KWGD3.5-R1	42	50	56	61	62	65
KWGD4-R1	42	51	56	61	63	67

■ Efficiency of KWG/AG, AGF Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No. \ Worm rpm	100	300	600	900	1200	1800
KWG0.5-R1	30	34	38	41	43	46
KWG0.8-R1	35	40	44	47	49	53
KWG1-R1	34	40	45	48	51	54
KWG1.5-R1	35	42	47	51	53	57
KWG2-R1	45	51	56	60	62	65
KWG2.5-R1	44	51	57	61	62	67
KWG3-R1	44	52	58	61	64	67
KWG4-R1	50	58	64	66	70	72
KWG5-R1	51	60	66	69	71	73
KWG6-R1	53	61	66	70	72	75
KWG0.5-R2	46	50	54	58	60	63
KWG0.8-R2	51	56	61	64	66	69
KWG1-R2	51	56	62	64	67	70
KWG1.5-R2	52	59	64	67	69	73
KWG2-R2	61	67	71	74	76	78
KWG2.5-R2	60	67	72	75	76	80
KWG3-R2	61	68	73	75	78	80
KWG4-R2	66	73	77	79	82	84

■ Efficiency of SW, SUM / CG, BG, PG Worm Gear Pair (%)

The efficiency is approximately as follows, depending on the assembly, loading, lubrication and rotational speed.

Catalog No.	Thread	Efficiency (%)
SW/SUW	Single thread	40 ~ 50%
	Double thread	50 ~ 60%

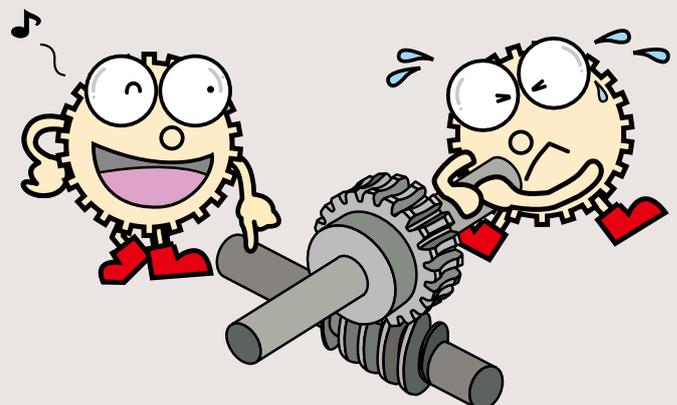
■ Efficiency of SWG/AG Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No. \ Worm rpm	100	300	600	900	1200	1800
SWG1-R1	34	40	45	48	51	54
SWG1.5-R1	35	42	47	51	53	57
SWG2-R1	38	45	51	55	56	61
SWG2.5-R1	40	48	54	57	60	63
SWG3-R1	41	49	55	58	62	65
SWG4-R1	42	51	56	61	63	67
SWG5-R1	46	54	60	64	66	70
SWG6-R1	48	57	64	66	68	73
SWG1-R2	51	56	62	64	67	70
SWG1.5-R2	52	59	64	67	69	73
SWG2-R2	55	62	67	70	72	75
SWG2.5-R2	57	64	69	72	75	77
SWG3-R2	58	66	71	73	76	78
SWG4-R2	59	67	72	75	77	80
SWG5-R2	62	70	75	78	79	82
SWG6-R2	65	72	77	80	81	84
SWG3-R3	67	74	78	80	82	84
SWG4-R3	68	75	79	82	83	86

2. Self-Locking Feature of Worm Gear Pair

Self-locking is defined as the inability of worm wheels to drive the worms. Factors affecting the self-locking feature include the materials of the worm and worm wheel, lead angle, precision of manufacture, types of bearings, lubricant, etc. Thus, it is not dependent simply on the lead angle. But, in general, self-locking will occur when the lead angle in a single thread worm is less than 4°. For systems requiring fail-safe prevention of back drive, we recommend other braking mechanisms or one-way clutches.





Worm Gear Pair

Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection. Use of catalog numbers when ordering will simplify and expedite the processing of your order.

1. Caution in Selecting the Mating Gears

Worms and worm wheels have either right-hand or left-hand helix. The same hand worms and worm wheels comprise sets. However, the number of threads and whether they use normal module or axial module system must also be matched. The table below shows available combinations of KHK stock worms and worm wheels.

Mating Worm Wheels Selection Chart

Worm	Mating Worm Wheel NOTE 1	Helix/ Thread	KWGDL KWGDLS			KWG			SWG				SW				SUW	
			R1	R1	R2	R1	R2	R3	R1	R2	L1	L2	R1	R2	R1	R2		
AGDL		R1	○															
AG0.5~1.5		R1		○														
AGF		R2			○													
AG		R1				○												
		R2					○											
		R3						○										
BG		R1							○								○	
		R2								○								
		L1									○							
		L2										○						
CG		R1										○					○	
		R2											○					
		L1												○				
		L2													○			
PG		R1															○	
		R2																
DG		R1															○	
		R2																

(NOTE 1) Select the same module for both members.

2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment as shown below. Therefore, they should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions.

Calculation assumptions for Surface Durability

Item	Catalog No.	KWGDL · KWGDLS/AGDL KWG/AGF, SWG/AG	SW/BG		SW/CG	SUW/PG	SUW/DG
			Formula of worm gear's strength (JGMA405-01)		The Lewis formula		
Formula NOTE 2			600rpm		100rpm	Allowable bending stress (kgf/mm ²)	
Rotations of worm			Lubricant for gears with proper viscosity and with anti-pressure additives			1.15 (40°C with No Lubrication) NOTE 3 1 (40°C with No Lubrication)	
Lubricant			Oil bath				
Lubrication			Starting torque less than 200% of rated torque. Less than 2 starts per hour				
Starting condition			26000 hours				
Durability			Uniform load				
Impact from motor			Uniform load				
Allowable stress factor S_{clim}		0.67	0.70		0.42		

(NOTE 2) The gear strength formula is based on JGMA (Japanese Gear Manufacturer's Association) specifications and "MC Nylon Technical Data" by Nippon Polyenco Limited. The units for the rotational speed (rpm) and the stress (kgf/mm²) are adjusted to the units needed in the formula.

(NOTE 3) Allowable bending stress of DG worm wheel is the value we estimated.

The Maximum Allowable Sliding Speed Due to Heat

The maximum allowable sliding speed for each series of worm wheels is given on the right. Select the appropriate part by calculating the sliding speed.

Sliding speed v_s (m/s)

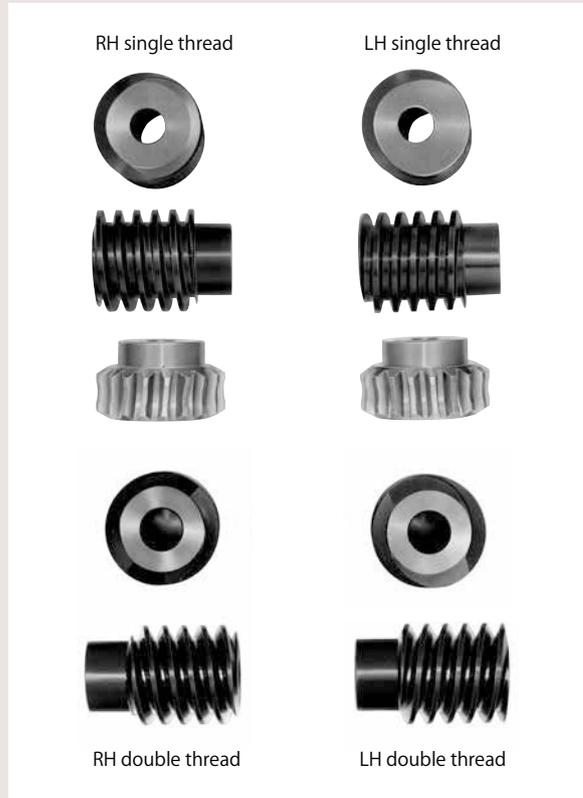
$$v_s = \frac{dn}{19100 \cos \gamma}$$

d : Worm pitch dia.
 n : Worm speed (rpm)
 γ : Worm nominal lead angle

Catalog No.	Max. Sliding Speed (m/s)
AGDL	* 15
AGF	* 15
AG	* 15
BG	* 10
CG	* 2.5
PG	1 (no lubrication)

* JGMA405-01

The Helixes of Worms and Worm Wheels



3. Selecting Worms and Worm Wheels by Precision

The precision standards of KHK stock worms and worm wheels are established by us. The table below indicates the tolerance ranges for our products.

① Precision of worms (KHK W 001)

KHK established allowable profile and lead errors of worms with precision grades 1 to 4, by using the JIS Standard as reference. Lead errors are measured over one full revolution.

■ Precision Grades of Worms (KHK W 001) (Unit: μm)

Grade	Error	Module				
		over m0.4 up to 1	over m1 up to 1.6	over m1.6 up to 2.5	over m2.5 up to 4	over m4 up to 6
1	Tooth profile error	8	12	16	20	25
	Lead error	7	9	11	13	16
2	Tooth profile error	12	16	20	24	29
	Lead error	15	18	21	25	28
3	Tooth profile error	16	23	30	37	50
	Lead error	20	23	27	33	37
4	Tooth profile error	20	30	40	50	70
	Lead error	30	32	38	46	52

② Precision of worm wheels (KHK W 002)

We have established standard grades 1 to 5 of worm wheels using the JIS Standard as reference. The allowable values of Single Pitch Error and Runout Error are defined for each module size and pitch diameter.

■ Precision Grades of Worm Wheels (KHK W 002)

Unit : μm

Grade	Error	Over m0.4 up to 1		Over m1 up to 1.6			Over m1.6 up to 2.5			Over m2.5 up to 4			Over m4 up to 6													
		Pitch diameter (mm)																								
		6 up to 12	12 up to 25	25 up to 50	50 up to 100	100 up to 200	12 up to 25	25 up to 50	50 up to 100	100 up to 200	200 up to 400	12 up to 25	25 up to 50	50 up to 100	100 up to 200	200 up to 400	400 up to 800	25 up to 50	50 up to 100	100 up to 200	200 up to 400	400 up to 800				
1	Single pitch error	5	6	7	7	9	6	7	8	9	10	7	7	8	9	11	8	9	10	11	13	9	10	11	13	14
	Total composite error	21	24	26	30	34	25	28	31	35	41	27	30	33	37	43	33	36	40	46	53	37	40	45	50	57
2	Single pitch error	8	8	9	10	12	9	10	11	12	14	9	10	12	13	15	11	13	14	16	18	13	14	16	18	20
	Total composite error	30	33	37	42	48	35	39	44	50	57	38	42	46	52	60	46	51	57	64	74	52	57	63	71	80
3	Single pitch error	11	12	13	15	17	12	14	16	18	20	13	15	16	19	21	16	18	20	23	26	19	20	22	25	29
	Total composite error	43	47	53	60	68	50	55	62	71	81	53	59	66	74	85	65	72	81	91	105	74	81	90	100	115
4	Single pitch error	15	17	19	21	24	18	19	22	25	29	19	21	23	26	30	23	25	28	32	37	26	28	32	35	40
	Total composite error	60	66	74	83	95	70	77	87	99	115	75	83	92	105	120	91	100	115	130	145	105	115	125	140	160
5	Single pitch error	21	24	26	30	34	25	28	31	35	41	27	30	33	37	43	33	36	40	46	53	37	40	45	50	57
	Total composite error	86	94	105	120	135	100	110	125	140	165	105	120	130	150	170	130	145	160	185	210	150	160	180	200	230

③ Overall Length Tolerance of Worms

■ Overall Length Tolerance of Worms

Series	Total length(mm)	Tolerance
KWGDL	Uniform	0 - 0.10
		0 - 0.15
SWG SW SUW	Less than 100	0 - 0.15
	Over 100	0 - 0.20
KWGDLS KWG	Uniform	Normal tolerance

■ Overall Length Tolerance of Worms Wheels

Total length(mm)	Tolerance
below 30	0 - 0.10
over 30 up to 100	0 - 0.15
over 100	0 - 0.20

[CAUTION] PG Plastic Wheels are excluded.



Worm Gear Pair

Application Hints



In order to use KHK stock worms and worm wheels safely, carefully read the Application Hints before proceeding. If there are questions or you require clarifications, please contact our technical department or your nearest distributor.

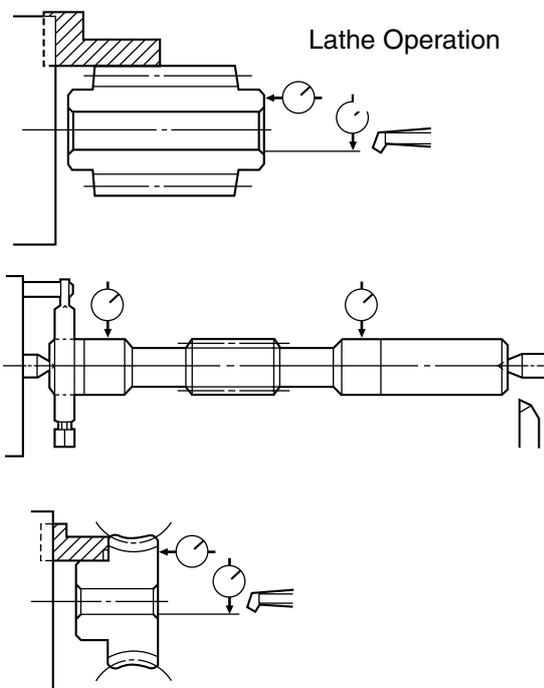
KHK Co., Ltd.

PHONE: 81-48-254-1744 FAX: 81-48-254-1765

E-mail export@khkgears.co.jp

1. Caution on Performing Secondary Operations

- ① If you are reboring, it is important to pay special attention to locating the center in order to avoid runout. (Fig.1) The reference datum for gear cutting or grinding is the bore. (For worm shafts, it is ground portion of the shaft.) Therefore, use the bore or shaft for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.



If chucking operation using scroll chucks is to be done, we recommend the use of new or rebored jaws for improved precision.

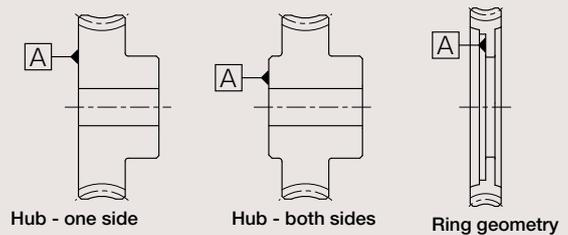
Fig.1

- ② To open up the bore to its maximum, calculate the bore size so that the tooth strength is weaker than the strength of the remaining material. For machining the maximum bore diameter, it should be designed so that the thickness between hub diameter (or root diameter) to bore diameter has more strength than the gear strength. As a guide, the maximum machined bore diameter should be within 60% to 70% of the hub diameter (or root diameter). When the keyway is processed, it should be 50% to 60%. In the case FC material is used, it should be lower by 10% or more.
- ③ Since worm wheels are molded products, they may have air bubbles inside the material. In case you find air bubbles inside when performing secondary operations, and if the bubbles are found to be troublesome, please contact your KHK distributor.

2. Points of Caution in Assembling

- ① KHK stock worms and worm wheels are designed such that when assembled according to the specified mounting distance with a tolerance of H7 to H8, the backlash shown in the product tables is obtained. Do not attempt to eliminate backlash by pushing worms into worm wheels or operate with the worm shifted in the direction along the tooth.
- ② The figure below shows the datum clamp face of a worm wheel. When assembling worm gears, be sure that the worm axis is in the center of the worm wheel face width.

Datum Clamp Face



- ③ Because of the helix of the gear teeth, worms and worm wheels produce axial thrust forces. The directions of thrust depend on the hand of the helix and the direction of rotation. This is illustrated below in Fig.2. The bearings must be selected properly to be able to handle these thrust forces. See the "Gear Forces" section in separate technical reference book for more details (Page 107).

Direction of rotation and thrust force

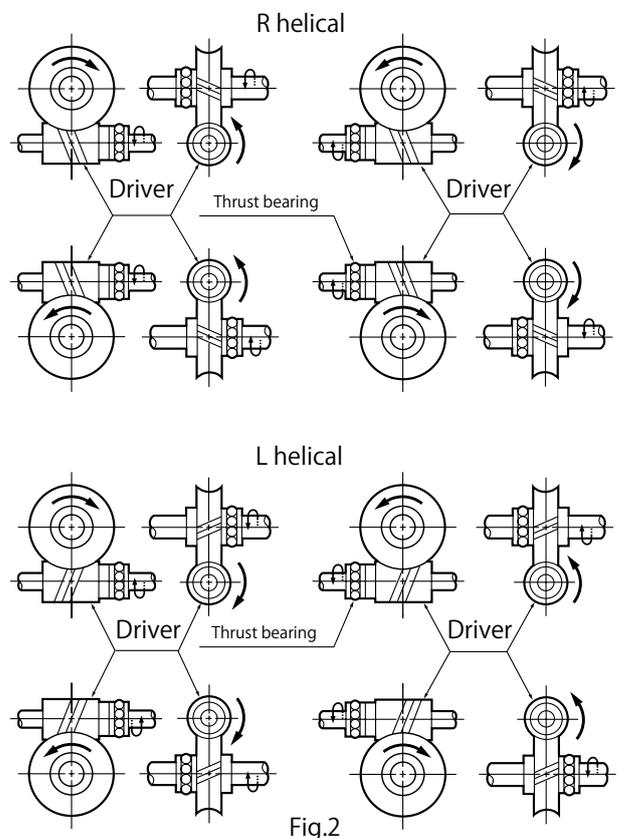


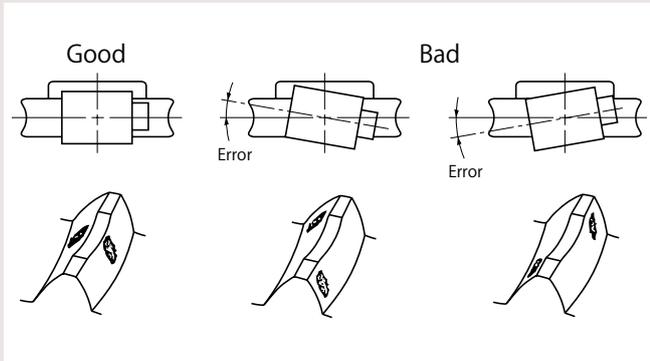
Fig.2

- ④ Because large thrust forces act on worms, if they are not secured to the shaft firmly, they tend to shift. Use of step shafts, set screws, dowel pins, etc., are recommended. Also, check for loosening of bearings due to thrust forces.

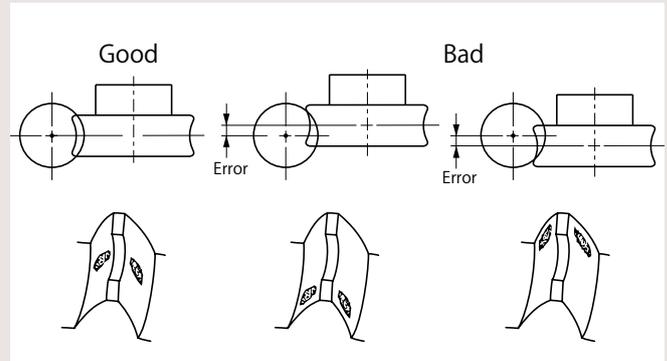
3. Verifying the orientation of assembly

How well the worms and worm wheels are assembled has large effects on the friction of the unit. The tooth contact at the time of assembly must be checked for correctness as shown below. See the "Tooth Contact of a Worm Gear Pair" section in separate technical reference book for more details (Page 67).

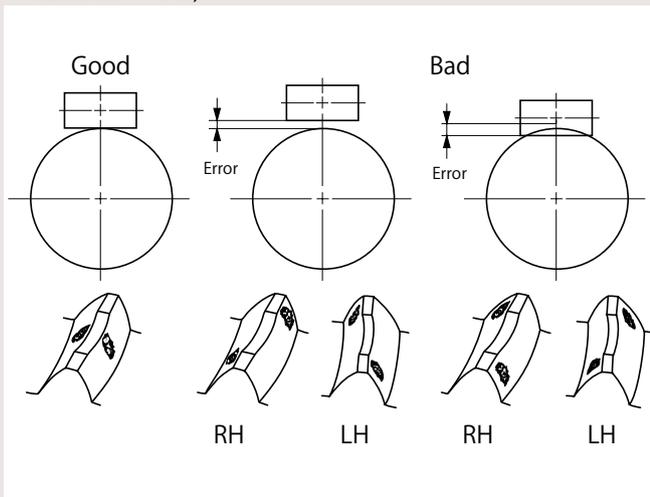
- Verify that the worm axis is perpendicular to the worm wheel axis.



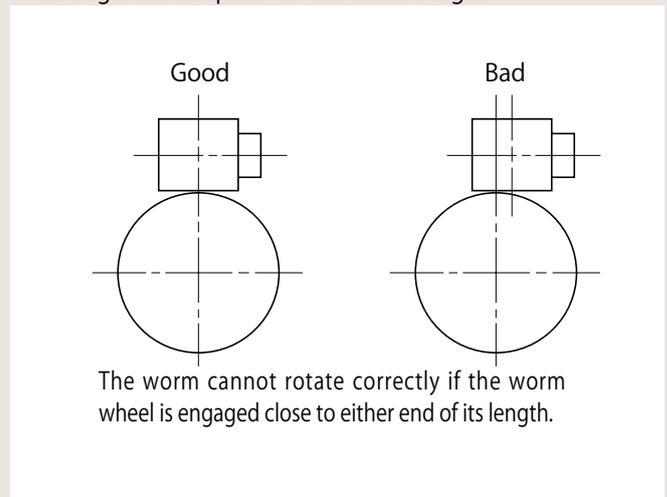
- Check that the worm axis is in the center of the worm wheel face width.



- Check the mounting distance (allowable mounting distance H7 ~ H8).



- Confirm that the center of the worm wheel goes through the midpoint of the worm length.



Application Examples



SW Worms and CG Worm Wheels used in a rotating comb device



SW Worms and BG Worm Wheels used in adjusting a cloth feeding device



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

■ Description of duplex worm gears

The usual method of adjusting the backlash of a worm gear assembly is to modify the center distance. Once assembled, such adjustment requires a major rework of the gearbox housing. The use of duplex worm gears allows the backlash adjustment to be made by axially shifting the worm. This simplifies greatly the assembly and maintenance operations. Because of the unique characteristics of the product, please take time to study its construction and proper use.

■ Backlash adjustment mechanism and method of adjustment

The dual-lead worm is formed to give a difference between the right tooth surface and left tooth surface so that it provides a unique tooth profile in which the tooth thickness varies continuously, corresponding with the lead difference. (Fig.1)

The worm gear is also formed in its right and left tooth surface.

When such a worm and worm gear are set up at a constant assembly distance and the worm is moved in the axial direction, the tooth thickness of the worm in mesh with the worm gear changes making backlash adjustment possible.



An arrow marking on the outer circumference of the hub of the KHK duplex worm indicates the direction of assembly as well as acts as a guide for the backlash adjustment. When the worm is held with arrow mark pointing right, the tooth thickness is thinner on the right and thicker on the left. Therefore, moving the worm to the right causes the thicker teeth to come into actual engagement with the worm gear, thereby reducing the backlash. (Fig.2)

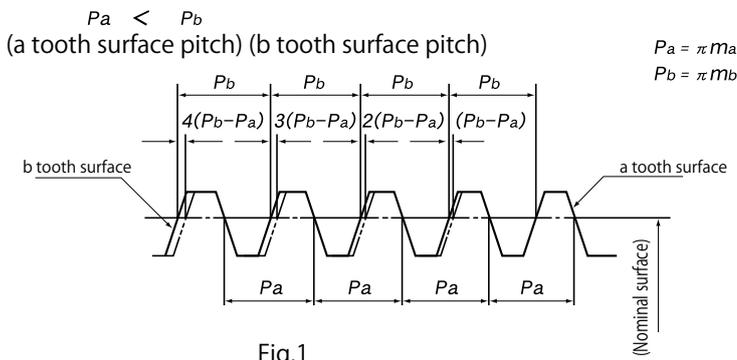
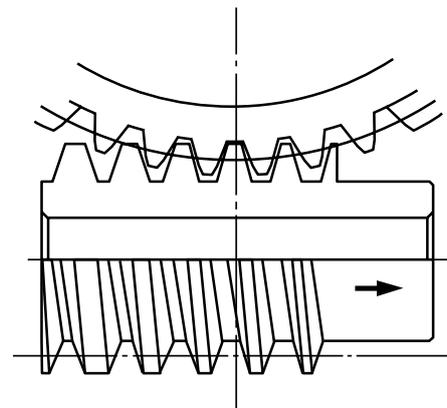


Fig.1

(CAUTION) The amount of change in backlash (Δj mm) in relation to the axial movement of the duplex worm shaft (V mm) can be calculated from the formula below.

$$\Delta j = 2V \frac{m_b - m_a}{m_a + m_b}$$

Where
 m_a = Nominal Axial Module - (0.01 × Nominal Axial Module)
 m_b = Nominal Axial Module + (0.01 × Nominal Axial Module)

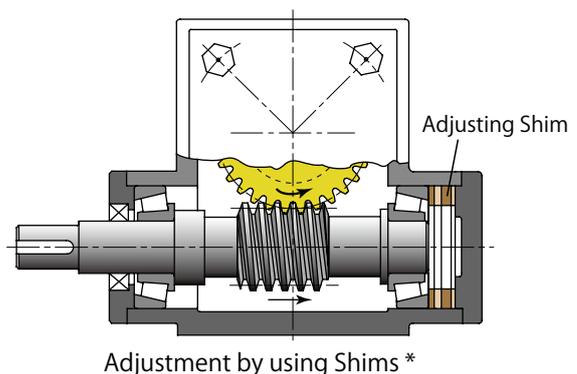
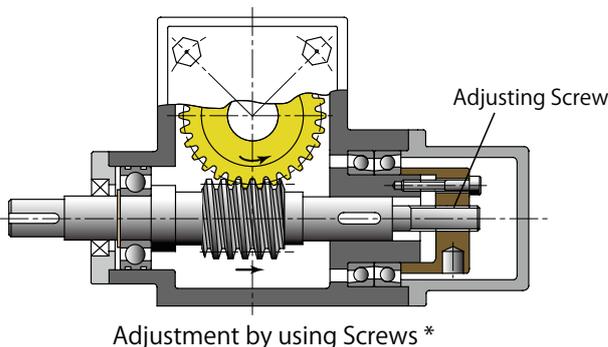


Reference tooth
 Moving the worm in the direction of the arrow causes the backlash to decrease.

Fig. 2

(CAUTION) The KHK duplex worm is designed so that, for all modules, the backlash reduces by 0.02 mm when the worm is shifted 1 mm.

■ Application Examples



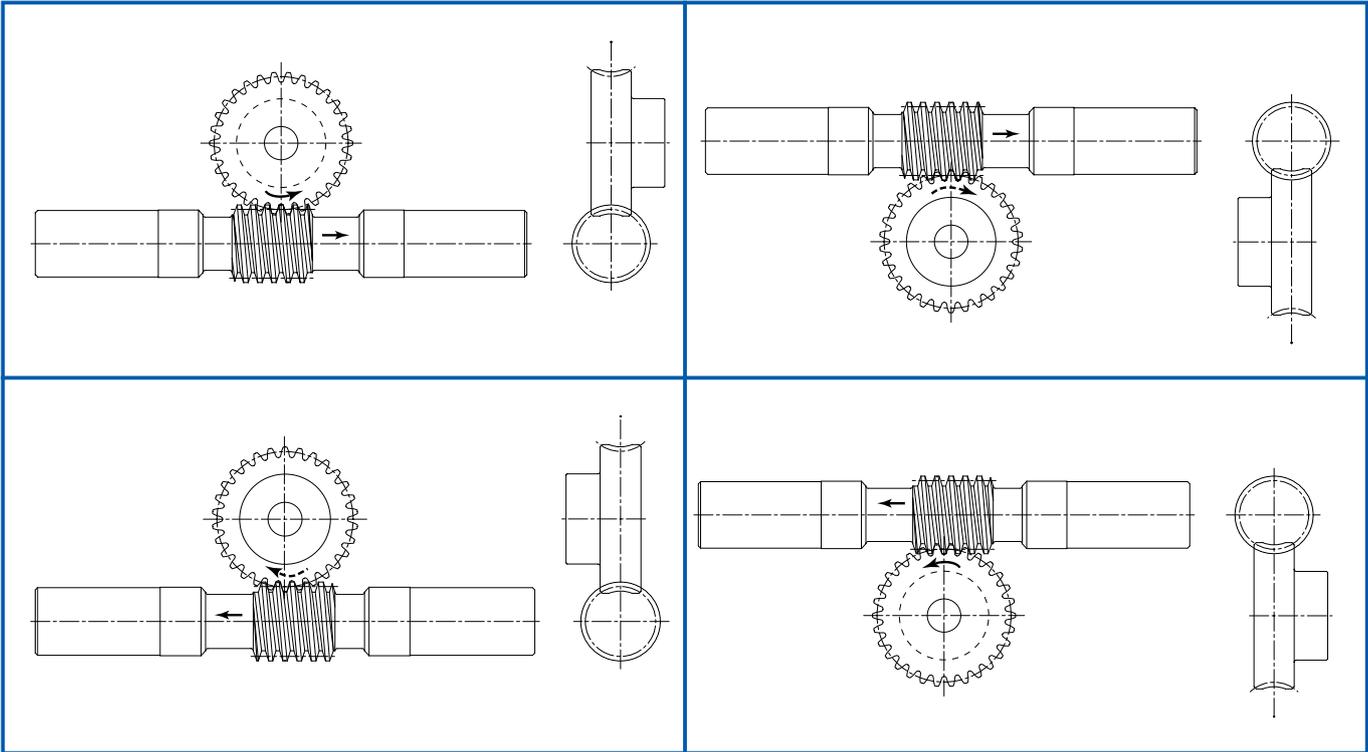
* The illustration above is a design example, not a design for machinery or a device in actual use.

Point of caution during assembly

KHK duplex worm gears differs in module between the right and left tooth surface and, therefore, you must orient the worm and worm wheel properly. Please carefully verify the following two aspects before proceeding with assembly.

1. Verifying the orientation of assembly

An arrow indicating the orientation of assembly is stamped on both the duplex worm and worm wheel. When assembling the worm and worm wheel, check the worm wheel of the arrow mark on the front such that the direction of arrow mark on the worm coincides with that on the worm wheel. Should the assembly be incorrect, the center distance "a" will become larger than the normal distance, resulting in difficulty of assembly and improper gear engagement. (Fig.3)



Arrow mark indicates the correct orientation of two gears when assembled. As shown, the two arrows must point in the same direction.

Fig. 3

2. Verifying the reference position

A V-groove (60°, 0.3 mm deep line) on tip peripheral of the duplex worm tooth marks the reference tooth. The gear set is designated to have a backlash of nearly zero (± 0.045) when the reference tooth is positioned in alignment with the center of rotation of the worm wheel with the center distance set at the value "a". (Fig.4)

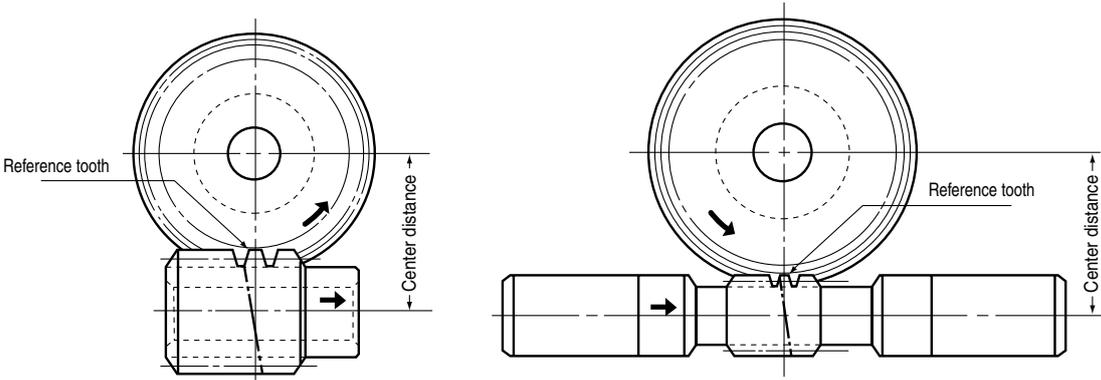


Fig. 4

Spur Gears
Helical Gears
Internal Gears
Racks
CP Racks & Pinions
Miter Gears
Bevel Gears
Screw Gears
Worm Gear Pair
Bevel Gearboxes
Other Products



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

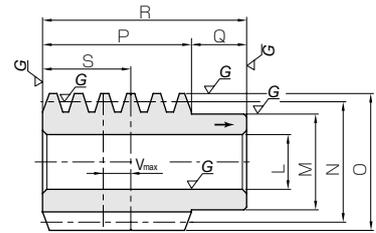
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W4

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _{H7}	M	N	O	P	Q	R
KWGD2-R1	m2	1	3°41'	R	W4	14	25	31	35	36	14	50

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWGDLS1.5-R1	m1.5	1	3°26'	R	W6	190	66	12	28	18	66	25
KWGDLS2-R1	m2	1	3°41'	R	W6	220	75	13	36	21	75	31

- [Caution on Product Characteristics] ① When the center distance is moved to reduce the backlash, the V max is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V max is not a recommended value to use for adjustment when assembling.
② These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see page 8.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

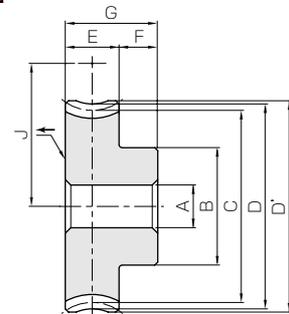
Worm Gear Pair

Bevel Gearboxes

Other Products



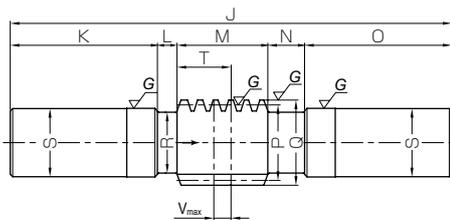
Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A & BC2)
Heat treatment	—
Tooth hardness	—



H1

Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A _{H7}	B	C	D	D'	E	F
AGDL1.5-20R1	20	m1.5	20	3°26'	R	H1	8	22	30	33	34.5	14	10
AGDL1.5-30R1	30		30	3°26'	R	H1	10	30	45	48	49.5	14	10
AGDL1.5-36R1	36		36	3°26'	R	H1	10	35	54	57	58.5	14	10
AGDL1.5-40R1	40		40	3°26'	R	H1	12	35	60	63	64.5	14	10
AGDL1.5-50R1	50		50	3°26'	R	H1	12	45	75	78	79.5	14	10
AGDL1.5-60R1	60		60	3°26'	R	H1	12	50	90	93	94.5	14	10
AGDL2-20R1	20	m2	20	3°41'	R	H1	12	33	40	44	46	18	15
AGDL2-30R1	30		30	3°41'	R	H1	15	40	60	64	66	18	15
AGDL2-36R1	36		36	3°41'	R	H1	15	45	72	76	78	18	15
AGDL2-40R1	40		40	3°41'	R	H1	15	45	80	84	86	18	15
AGDL2-50R1	50		50	3°41'	R	H1	15	50	100	104	106	18	15
AGDL2-60R1	60		60	3°41'	R	H1	15	60	120	124	126	18	15

- [Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.
② Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on Page 347.



W6

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	V _{max}		
22	8	0.21	KWGD_L2-R1

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	V _{max}		
28	21	26.2	17	6	0.74	KWGD_S1.5-R1
35	24	30.2	22	8	1.17	KWGD_S2-R1

- [Caution on Secondary Operations]
- ① Please read “Caution on Performing Secondary Operations” (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK’s system for quick modification of KHK stock gears is also available.
 - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AGDL

Duplex Worm Wheels



NOTE 1 : Allowable torque for worm revolution (rpm)

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.	
				30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}				1800 _{rpm}
24	—	—	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0±0.045	0.10	AGDL1.5-20R1
24	—	—	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0±0.045	0.22	AGDL1.5-30R1
24	—	—	39.5	29.3	24.6	19.8	16.8	14.9	13.5	11.9	0±0.045	0.32	AGDL1.5-36R1
24	—	—	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0±0.045	0.37	AGDL1.5-40R1
24	—	—	50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0±0.045	0.59	AGDL1.5-50R1
24	—	—	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0±0.045	0.83	AGDL1.5-60R1
33	—	—	35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0±0.045	0.26	AGDL2-20R1
33	—	—	45.5	44.3	37.3	29.6	24.8	21.9	19.8	17.4	0±0.045	0.51	AGDL2-30R1
33	—	—	51.5	62.3	52.6	42.0	35.5	31.3	28.4	25.0	0±0.045	0.73	AGDL2-36R1
33	—	—	55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7	0±0.045	0.86	AGDL2-40R1
33	—	—	65.5	115	96.8	78.4	66.9	59.5	54.2	47.6	0±0.045	1.30	AGDL2-50R1
33	—	—	75.5	160	136	110	94.6	84.9	77.2	68.1	0±0.045	1.88	AGDL2-60R1

- [Caution on Secondary Operations]
- ① Please read “Caution on Performing Secondary Operations” (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK’s system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

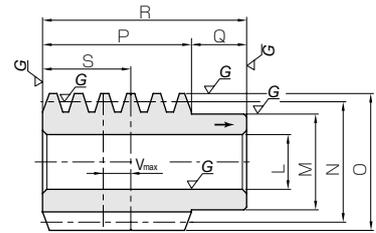
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W4

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _{H7}	M	N	O	P	Q	R
KWGD2.5-R1	m2.5	1	3°52'	R	W4	18	30	37	42	48	17	65
KWGD3-R1	m3	1	3°54'	R	W4	20	35	44	50	54	20	74

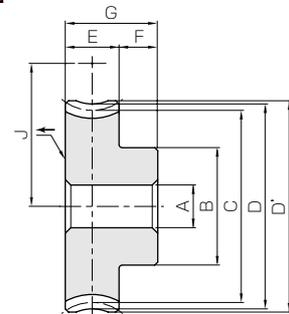
Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWGDLS2.5-R1	m2.5	1	3°52'	R	W6	260	85	16	48	26	85	37
KWGDLS3-R1	m3	1	3°54'	R	W6	300	100	18	54	28	100	44

[Caution on Product Characteristics] ① When the center distance is moved to reduce the backlash, the V max is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V max is not a recommended value to use for adjustment when assembling.
② These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see page 8.



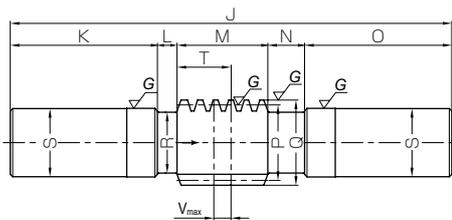
Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A & BC2)
Heat treatment	—
Tooth hardness	—



H1

Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A _{H7}	B	C	D	D'	E	F
AGDL2.5-20R1	20	m2.5	20	3°52'	R	H1	15	40	50	55	57.5	22	15
AGDL2.5-30R1	30		30	3°52'	R	H1	15	40	75	80	82.5	22	15
AGDL2.5-36R1	36		36	3°52'	R	H1	15	45	90	95	97.5	22	15
AGDL2.5-40R1	40		40	3°52'	R	HB	15	45	100	105	107.5	22	15
AGDL2.5-50R1	50		50	3°52'	R	HB	15	60	125	130	132.5	22	15
AGDL2.5-60R1	60		60	3°52'	R	HB	15	80	150	155	157.5	22	15
AGDL3-20R1	20	m3	20	3°54'	R	H1	20	50	60	66	69	28	17
AGDL3-30R1	30		30	3°54'	R	H1	20	55	90	96	99	28	17
AGDL3-36R1	36		36	3°54'	R	H1	20	60	108	114	117	28	17
AGDL3-40R1	40		40	3°54'	R	HB	20	60	120	126	129	28	17
AGDL3-50R1	50		50	3°54'	R	HB	20	70	150	156	159	28	17
AGDL3-60R1	60		60	3°54'	R	HB	20	80	180	186	189	28	17

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.
② Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on Page 347.



W6

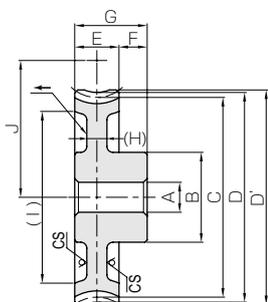
Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	Vmax		
29	10	0.37	KWGDL2.5-R1
32	10	0.61	KWGDL3-R1

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	Vmax		
42	30	36.2	29	10	2.00	KWGDLs2.5-R1
50	34	40.2	32	10	2.95	KWGDLs3-R1

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AGDL

Duplex Worm Wheels



HB

* CS has a sand mold casting finish.

NOTE 1 : Allowable torque for worm revolution (rpm)



Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
				30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
37	—	—	43.5	38.1	31.4	24.5	20.1	17.6	16.0	13.8	0±0.045	0.45	AGDL2.5-20R1
37	—	—	56	80.5	67.1	53.1	44.5	39.1	35.5	30.9	0±0.045	0.88	AGDL2.5-30R1
37	—	—	63.5	113	94.5	75.5	63.8	56.0	51.0	44.3	0±0.045	1.25	AGDL2.5-36R1
37	(10)	(86)	68.5	138	115	92.4	78.3	68.8	62.7	54.4	0±0.045	1.14	AGDL2.5-40R1
37	(12)	(108)	81	208	174	141	120	106	97.3	84.3	0±0.045	1.93	AGDL2.5-50R1
37	(12)	(133)	93.5	291	245	198	170	152	139	121	0±0.045	2.90	AGDL2.5-60R1
45	—	—	52	65.0	53.3	41.5	33.8	29.5	26.9	22.8	0±0.045	0.81	AGDL3-20R1
45	—	—	67	137	114	90.0	74.7	65.5	59.5	51.2	0±0.045	1.65	AGDL3-30R1
45	—	—	76	193	160	128	107	93.8	85.6	73.4	0±0.045	2.32	AGDL3-36R1
45	(14)	(106)	82	235	195	157	131	115	105	90.1	0±0.045	2.19	AGDL3-40R1
45	(14)	(134)	97	355	295	239	202	178	163	140	0±0.045	3.26	AGDL3-50R1
45	(14)	(164)	112	497	415	336	285	254	233	200	0±0.045	4.48	AGDL3-60R1

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

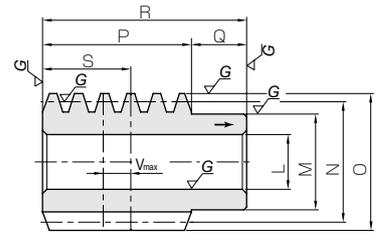
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W4

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _{H7}	M	N	O	P	Q	R
KWGD3.5-R1	m3.5	1	3°47'	R	W4	24	44	53	60	62	23	85
KWGD4-R1	m4	1	3°41'	R	W4	28	50	62	70	74	26	100

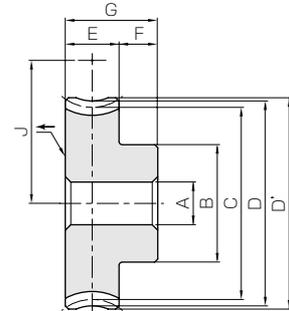
Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWGDLS3.5-R1	m3.5	1	3°47'	R	W6	330	110	18	62	30	110	53
KWGDLS4-R1	m4	1	3°41'	R	W6	360	120	16	74	30	120	62

[Caution on Product Characteristics] ① When the center distance is moved to reduce the backlash, the V max is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V max is not a recommended value to use for adjustment when assembling.
② These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see page 8.



Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A& BC2) *
Heat treatment	—
Tooth hardness	—

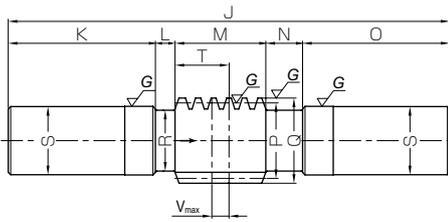


H1

* H5 shape have a hub made from S45C cast iron.

Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A _{H7}	B	C	D	D'	E	F
AGDL3.5-20R1	20	m3.5	20	3°47'	R	H1	20	55	70	77	80.5	32	18
AGDL3.5-30R1	30		30	3°47'	R	H1	20	60	105	112	115.5	32	18
AGDL3.5-36R1	36		36	3°47'	R	H1	20	70	126	133	136.5	32	18
AGDL3.5-40R1	40		40	3°47'	R	HB	20	70	140	147	150.5	32	18
AGDL3.5-50R1	50		50	3°47'	R	HB	20	80	175	182	185.5	32	18
AGDL3.5-60R1	60		60	3°47'	R	HB	20	90	210	217	220.5	32	18
AGDL4-20R1	20	m4	20	3°41'	R	H1	20	60	80	88	92	35	20
AGDL4-30R1	30		30	3°41'	R	HB	20	65	120	128	132	35	20
AGDL4-36R1	36		36	3°41'	R	HB	20	75	144	152	156	35	20
AGDL4-40R1	40		40	3°41'	R	HB	20	75	160	168	172	35	20
AGDL4-50R1	50		50	3°41'	R	HB	20	90	200	208	212	35	20
AGDL4-60R1	60		60	3°41'	R	H5	30	120	240	248	252	35	20

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.
② Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on Page 347.



W6

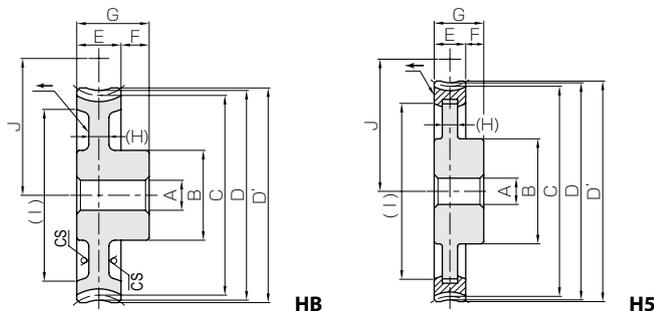
Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	Vmax		
37	12	1.05	KWGDL3.5-R1
44	14	1.67	KWGDL4-R1

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	Vmax		
60	42	48.2	37	12	4.72	KWGDLs3.5-R1
70	50	56.2	44	14	7.10	KWGDLs4-R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AGDL

Duplex Worm Wheels



* CS has a sand mold casting finish.

NOTE 1 : Allowable torque for worm revolution (rpm)



Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
				30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
50	—	—	61.5	98.5	80.4	62.5	50.4	44.2	40.0	33.7	0±0.045	1.24	AGDL3.5-20R1
50	—	—	79	208	172	136	111	98.1	88.3	75.7	0±0.045	2.51	AGDL3.5-30R1
50	—	—	89.5	293	242	193	160	141	127	109	0±0.045	3.61	AGDL3.5-36R1
50	(15)	(124)	96.5	356	295	236	196	173	156	133	0±0.045	3.34	AGDL3.5-40R1
50	(16)	(155)	114	538	446	360	301	267	243	207	0±0.045	5.02	AGDL3.5-50R1
50	(16)	(189)	131.5	753	627	506	425	381	345	296	0±0.045	6.87	AGDL3.5-60R1
55	—	—	71	134	109	84.8	67.9	59.7	53.4	44.8	0±0.045	1.76	AGDL4-20R1
55	(17)	(99)	91	284	234	184	150	132	118	101	0±0.045	3.01	AGDL4-30R1
55	(17)	(121)	103	400	329	262	215	190	170	144	0±0.045	4.18	AGDL4-36R1
55	(17)	(137)	111	486	400	320	264	233	208	177	0±0.045	4.78	AGDL4-40R1
55	(17)	(177)	131	735	605	488	405	361	324	275	0±0.045	7.07	AGDL4-50R1
55	(17)	(200)	151	1030	851	687	572	515	461	393	0±0.045	11.5	AGDL4-60R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



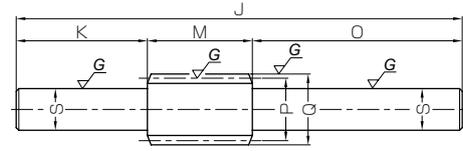
KWG Ground Worm Shafts



Module 0.5, 0.8



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W5

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG0.5-R1	m0.5	1	3°11'	R	W5	65	19	—	12	—	34	9
KWG0.5-R2		2	6°20'	R	W5	65	19	—	12	—	34	9
KWG0.8-R1	m0.8	1	3°49'	R	W5	85	25	—	20	—	40	12
KWG0.8-R2		2	7°36'	R	W5	85	25	—	20	—	40	12

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.



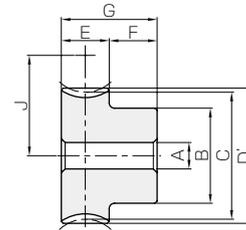
AG Worm Wheels



Module 0.5, 0.8



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A & BC2)
Heat treatment	—
Tooth hardness	—



HA

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
AG0.5-20R1	20	m0.5	20	1	3°11'	R	HA	4	9	10	—	11	5
AG0.5-20R2	10		20	2	6°20'	R	HA	4	9	10	—	11	5
AG0.5-30R1	30		30	1	3°11'	R	HA	4	12	15	—	16	5
AG0.5-30R2	15		30	2	6°20'	R	HA	4	12	15	—	16	5
AG0.5-40R1	40		40	1	3°11'	R	HA	5	15	20	—	21	5
AG0.5-50R1	50	m0.5	50	1	3°11'	R	HA	5	20	25	—	26	5
AG0.5-60R1	60		60	1	3°11'	R	HA	5	25	30	—	31	5
AG0.8-20R1	20	m0.8	20	1	3°49'	R	HA	5	12	16	—	17.6	8
AG0.8-20R2	10		20	2	7°36'	R	HA	5	12	16	—	17.6	8
AG0.8-30R1	30		30	1	3°49'	R	HA	5	18	24	—	25.6	8
AG0.8-30R2	15		30	2	7°36'	R	HA	5	18	24	—	25.6	8
AG0.8-40R1	40		40	1	3°49'	R	HA	6	20	32	—	33.6	8
AG0.8-50R1	50	m0.8	50	1	3°49'	R	HA	8	25	40	—	41.6	8
AG0.8-60R1	60		60	1	3°49'	R	HA	8	25	48	—	49.6	8

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S _{n7}		
10	—	6	0.018	KWG0.5-R1
10	—	6	0.018	KWG0.5-R2
13.6	—	8	0.043	KWG0.8-R1
13.6	—	8	0.043	KWG0.8-R2

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AG

Worm Wheels



NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}			
F	G	(H)	(I)	J										
7	12	—	—	9.5	0.52	0.44	0.36	0.30	0.26	0.24	0.21	0.02~0.14	0.0056	AG0.5-20R1
7	12	—	—	9.5	0.51	0.42	0.33	0.27	0.24	0.22	0.19	0.02~0.14	0.0056	AG0.5-20R2
7	12	—	—	12	1.09	0.94	0.77	0.65	0.58	0.53	0.48	0.02~0.14	0.012	AG0.5-30R1
7	12	—	—	12	1.09	0.92	0.73	0.60	0.54	0.49	0.43	0.02~0.14	0.012	AG0.5-30R2
7	12	—	—	14.5	1.86	1.60	1.34	1.15	1.02	0.94	0.84	0.02~0.14	0.020	AG0.5-40R1
7	12	—	—	17	2.82	2.42	2.05	1.77	1.58	1.46	1.30	0.02~0.14	0.035	AG0.5-50R1
7	12	—	—	19.5	3.94	3.41	2.89	2.50	2.26	2.08	1.87	0.02~0.14	0.053	AG0.5-60R1
8	16	—	—	14	1.78	1.50	1.21	1.00	0.88	0.82	0.71	0.06~0.17	0.018	AG0.8-20R1
8	16	—	—	14	1.76	1.44	1.11	0.91	0.80	0.74	0.63	0.06~0.17	0.018	AG0.8-20R2
8	16	—	—	18	3.77	3.21	2.62	2.20	1.96	1.81	1.61	0.06~0.17	0.043	AG0.8-30R1
8	16	—	—	18	3.75	3.14	2.46	2.02	1.80	1.65	1.45	0.06~0.17	0.043	AG0.8-30R2
8	16	—	—	22	6.45	5.49	4.55	3.87	3.46	3.19	2.83	0.06~0.17	0.068	AG0.8-40R1
8	16	—	—	26	9.75	8.31	6.94	5.94	5.34	4.96	4.38	0.06~0.17	0.10	AG0.8-50R1
8	16	—	—	30	13.6	11.7	9.77	8.39	7.63	7.05	6.27	0.06~0.17	0.14	AG0.8-60R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur
GearsHelical
GearsInternal
Gears

Racks

CP Racks
& PinionsMiter
GearsBevel
GearsScrew
GearsWorm
Gear PairBevel
GearboxesOther
Products



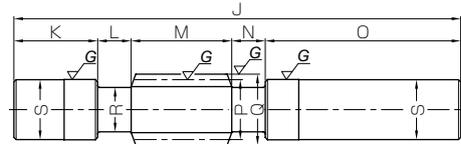
KWG Ground Worm Shafts



Module 1, 1.5



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG1-R1 KWG1-R2	m1	1	3°35'	R	W6	140	35	10	30	10	55	16
		2	7°08'	R	W6	140	35	10	30	10	55	16
KWG1.5-R1 KWG1.5-R2	m1.5	1	3°26'	R	W6	190	50	15	40	15	70	25
		2	6°51'	R	W6	190	50	15	40	15	70	25

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



AG Worm Wheels

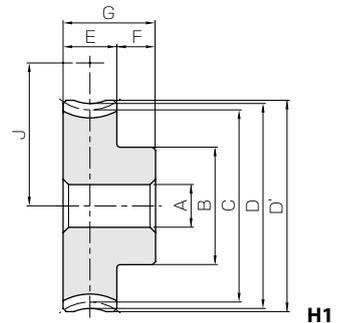


Module 1, 1.5



Specifications		
Precision grade	KHK W 002 grade 2	
Reference section of gear	Rotating plane	
Gear teeth	Standard full depth	
Normal pressure angle	20°	
Material	CAC702 (formerly JIS AIBC2)	
Heat treatment	—	
Tooth hardness	—	
Module	m1	m1.5
Face width (E)	10	14
Hub width (F)	10	10
Total length (G)	20	24
Screw offset (L)	5	5

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



* The precision grade of J Series products is equivalent to the value shown in the table.

NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	(H)	(I)	J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm		
AG1-20R1	20	20	1	3°35'	R	H1	6	16	20	22	23	—	—	18	3.35	2.79	2.23	1.83	1.63	1.50	1.30	0.08~0.19	0.038
AG1-20R2	10	20	2	7°08'	R	H1	6	16	20	22	23	—	—	18	3.31	2.69	2.06	1.68	1.48	1.35	1.15	0.08~0.19	0.038
AG1-30R1	30	30	1	3°35'	R	H1	6	20	30	32	33	—	—	23	7.08	5.98	4.84	4.05	3.63	3.31	2.92	0.08~0.19	0.078
AG1-30R2	15	30	2	7°08'	R	H1	6	20	30	32	33	—	—	23	7.03	5.84	4.56	3.72	3.33	3.03	2.63	0.08~0.19	0.078
AG1-40R1	40	40	1	3°35'	R	H1	8	26	40	42	43	—	—	28	12.1	10.2	8.43	7.12	6.38	5.86	5.13	0.08~0.19	0.13
AG1-50R1	50	50	1	3°35'	R	H1	8	30	50	52	53	—	—	33	18.3	15.5	12.9	10.9	9.87	9.09	7.95	0.08~0.19	0.20
AG1-60R1	60	60	1	3°35'	R	H1	10	35	60	62	63	—	—	38	25.6	21.8	18.1	15.4	14.1	12.9	11.4	0.08~0.19	0.29
AG1.5-20R1	20	20	1	3°26'	R	H1	8	22	30	33	34.5	—	—	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0.10~0.21	0.10
AG1.5-20R2	10	20	2	6°51'	R	H1	8	22	30	33	34.5	—	—	27.5	9.72	7.87	5.92	4.87	4.25	3.83	3.27	0.10~0.21	0.10
AG1.5-30R1	30	30	1	3°26'	R	H1	10	30	45	48	49.5	—	—	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0.10~0.21	0.22
AG1.5-30R2	15	30	2	6°51'	R	H1	10	30	45	48	49.5	—	—	35	20.7	17.1	13.1	10.8	9.56	8.58	7.46	0.10~0.21	0.22
AG1.5-40R1	40	40	1	3°26'	R	H1	12	35	60	63	64.5	—	—	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0.10~0.21	0.37
AG1.5-50R1	50	50	1	3°26'	R	H1	12	45	75	78	79.5	—	—	50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0.10~0.21	0.59
AG1.5-60R1	60	60	1	3°26'	R	H1	12	50	90	93	94.5	—	—	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0.10~0.21	0.83

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
18	13	18.2	0.25	KWG1-R1
18	13	18.2	0.25	KWG1-R2
28	21	26.2	0.74	KWG1.5-R1
28	21	26.2	0.74	KWG1.5-R2

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AG

J Series

Worm Wheels

Newly added

To order J Series products, please specify; Catalog No. + J + BORE

Bore H7	* The product shapes of J Series items are identified by background color.														
Keyway Js9	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30
Screw size	—		4 × 1.8			5 × 2.3			6 × 2.8			8 × 3.3			
Catalog No.	M4	M5	M4						M5			M6			
AG1-20R1 J BORE															
AG1-20R2 J BORE															
AG1-30R1 J BORE															
AG1-30R2 J BORE															
AG1-40R1 J BORE															
AG1-50R1 J BORE															
AG1-60R1 J BORE															
AG1.5-20R1 J BORE															
AG1.5-20R2 J BORE															
AG1.5-30R1 J BORE															
AG1.5-30R2 J BORE															
AG1.5-40R1 J BORE															
AG1.5-50R1 J BORE															
AG1.5-60R1 J BORE															

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
 - ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
 - ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
 - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
 - ⑤ For products having a tapped hole, a set screw is included.



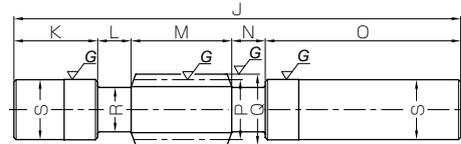
KWG Ground Worm Shafts



Module 2、2.5



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG2-R1	m2	1	5°12'	R	W6	200	35	25	40	25	75	22
KWG2-R2		2	10°18'	R	W6	200	35	25	40	25	75	22
KWG2.5-R1	m2.5	1	4°46'	R	W6	250	50	27	46	27	100	30
KWG2.5-R2		2	9°28'	R	W6	250	50	27	46	27	100	30

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



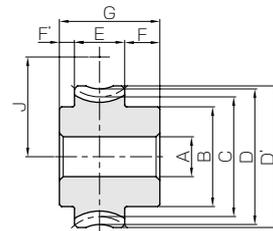
AGF Worm Wheels



Module 2、2.5



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A& BC2) *
Heat treatment	—
Tooth hardness	—



* H8, H9 shape have a hub made from FC200 cast iron.

H6

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Profile shift coefficient	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									A _{H7}	B	C	D	D'	E	F
AGF2-20R1	20	m2	20	1	-0.5	5°12'	R	H6	12	32	40	42	44	18	12
AGF2-20R2	10		20	2	-0.5	10°18'	R	H6	12	32	40	42	44	18	12
AGF2-25R1	25		25	1	-0.5	5°12'	R	H6	12	35	50	52	54	18	12
AGF2-30R1	30		30	1	-0.5	5°12'	R	H6	12	38	60	62	64	18	12
AGF2-30R2	15		30	2	-0.5	10°18'	R	H6	12	38	60	62	64	18	12
AGF2-36R1	36		36	1	0	5°12'	R	H6	12	40	72	76	78	18	12
AGF2-40R1	40	40	1	-0.5	5°12'	R	H8	12	45	80	82	84	18	12	
AGF2-48R1	48	48	1	+0.5	5°12'	R	H9	12	50	96	102	104	18	12	
AGF2-50R1	50	50	1	-0.5	5°12'	R	H9	12	50	100	102	104	18	12	
AGF2-60R1	60	60	1	-0.5	5°12'	R	H9	12	50	120	122	124	18	12	
AGF2.5-20R1	20	m2.5	20	1	0	4°46'	R	H6	12	35	50	55	57.5	20	15
AGF2.5-20R2	10		20	2	0	9°28'	R	H6	12	35	50	55	57.5	20	15
AGF2.5-25R1	25		25	1	0	4°46'	R	H6	12	40	62.5	67.5	70	20	15
AGF2.5-30R1	30		30	1	0	4°46'	R	H6	12	40	75	80	82.5	20	15
AGF2.5-30R2	15		30	2	0	9°28'	R	H6	12	40	75	80	82.5	20	15
AGF2.5-36R1	36		36	1	0	4°46'	R	H8	12	45	90	95	97.5	20	15
AGF2.5-40R1	40	40	1	0	4°46'	R	H8	12	50	100	105	107.5	20	15	
AGF2.5-48R1	48	48	1	0	4°46'	R	H9	12	50	120	125	127.5	20	15	
AGF2.5-50R1	50	50	1	0	4°46'	R	H9	12	55	125	130	132.5	20	15	
AGF2.5-60R1	60	60	1	0	4°46'	R	H9	12	60	150	155	157.5	20	15	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.

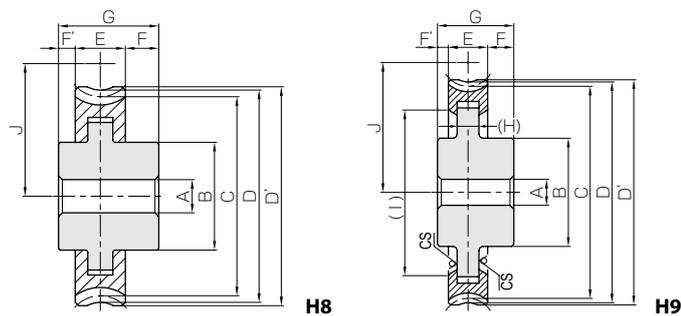
Ground Worm Shafts

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
26	17	25.2	0.64	KWG2-R1
26	17	25.2	0.64	KWG2-R2
35	23	30.2	1.27	KWG2.5-R1
35	23	30.2	1.27	KWG2.5-R2

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AGF

Worm Wheels



NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) <small>NOTE 1</small>						Backlash (mm)	Weight (kg)	Catalog No.	
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm				1800 rpm
F	G	(H)	(I)	J										
5	35	—	—	30	19.4	16.1	12.8	10.5	9.30	8.49	7.31	0.11~0.24	0.25	AGF2-20R1
5	35	—	—	30	19.9	16.1	12.2	9.99	8.75	7.92	6.74	0.11~0.24	0.25	AGF2-20R2
5	35	—	—	35	29.4	24.5	19.6	16.3	14.4	13.2	11.4	0.11~0.24	0.37	AGF2-25R1
5	35	—	—	40	41.1	34.5	27.7	23.2	20.7	18.8	16.4	0.11~0.24	0.51	AGF2-30R1
5	35	—	—	40	42.3	35.0	27.0	22.1	19.9	17.7	15.4	0.11~0.24	0.51	AGF2-30R2
5	35	—	—	47	57.8	48.6	39.3	33.2	29.6	27.0	23.6	0.11~0.24	0.73	AGF2-36R1
5	35	—	—	50	70.3	59.2	48.1	40.7	36.4	33.2	28.9	0.11~0.24	0.85	AGF2-40R1
5	35	(10)	(76)	60	98.5	83.0	68.0	57.9	51.9	47.5	41.3	0.11~0.24	1.14	AGF2-48R1
5	35	(12)	(81)	60	106	89.5	73.4	62.5	56.2	51.5	44.9	0.11~0.24	1.14	AGF2-50R1
5	35	(12)	(96)	70	149	126	103	88.4	80.3	73.3	64.2	0.11~0.24	1.51	AGF2-60R1
5	40	—	—	40	35.1	29.0	22.6	18.6	16.3	14.8	12.8	0.14~0.27	0.44	AGF2.5-20R1
5	40	—	—	40	34.6	27.9	20.9	17.1	14.8	13.4	11.3	0.14~0.27	0.44	AGF2.5-20R2
5	40	—	—	46.25	53.0	43.9	34.8	28.9	25.3	23.0	20.0	0.14~0.27	0.66	AGF2.5-25R1
5	40	—	—	52.5	74.1	62.0	49.1	41.2	36.7	32.8	28.7	0.14~0.27	0.87	AGF2.5-30R1
5	40	—	—	52.5	73.6	60.6	46.2	37.8	33.2	29.9	25.8	0.14~0.27	0.87	AGF2.5-30R2
5	40	—	—	60	104	87.4	69.8	59.0	51.8	47.1	41.2	0.14~0.27	1.19	AGF2.5-36R1
5	40	—	—	65	127	106	85.4	72.4	63.7	57.9	50.5	0.14~0.27	1.23	AGF2.5-40R1
5	40	(13)	(97)	75	178	149	121	103	90.8	83.1	72.2	0.14~0.27	1.72	AGF2.5-48R1
5	40	(13)	(100)	77.5	192	161	130	111	98.4	90.0	78.3	0.14~0.27	1.92	AGF2.5-50R1
5	40	(13)	(125)	90	268	226	183	157	141	128	112	0.14~0.27	2.59	AGF2.5-60R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



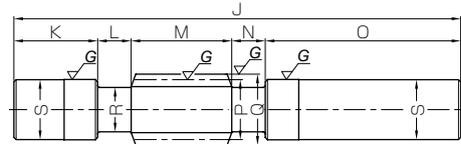
KWG Ground Worm Shafts



Module 3、4



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG3-R1	m3	1	4°31'	R	W6	300	55	30	60	30	125	38
KWG3-R2		2	8°58'	R	W6	300	55	30	60	30	125	38
KWG4-R1	m4	1	5°43'	R	W6	360	70	32.5	75	32.5	150	40
KWG4-R2		2	11°19'	R	W6	360	70	32.5	75	32.5	150	40

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



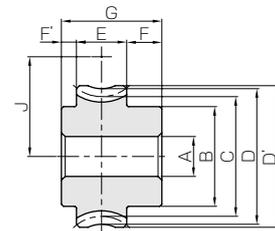
AGF Worm Wheels



Module 3、4



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



H6

* H8, H9 shape have a hub made from FC200 cast iron.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Profile shift coefficient	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									A _{H7}	B	C	D	D'	E	F
AGF3-20R1	20	m3	20	1	+0.333	4°31'	R	H6	20	50	60	68	71	25	17.5
AGF3-20R2	10		20	2	+0.333	8°58'	R	H6	20	50	60	68	71	25	17.5
AGF3-25R1	25		25	1	0	4°31'	R	H6	20	55	75	81	84	25	17.5
AGF3-30R1	30		30	1	+0.333	4°31'	R	H8	20	55	90	98	101	25	17.5
AGF3-30R2	15		30	2	+0.333	8°58'	R	H8	20	55	90	98	101	25	17.5
AGF3-36R1	36		36	1	+0.333	4°31'	R	H8	20	60	108	116	119	25	17.5
AGF3-40R1	40		40	1	+0.333	4°31'	R	H8	20	70	120	128	131	25	17.5
AGF3-48R1	48		48	1	+0.333	4°31'	R	H9	20	70	144	152	155	25	17.5
AGF3-50R1	50		50	1	+0.333	4°31'	R	H9	20	75	150	158	161	25	17.5
AGF3-60R1	60		60	1	+0.333	4°31'	R	H9	20	80	180	188	191	25	17.5
AGF4-20R1	20	m4	20	1	0	5°43'	R	H6	20	60	80	88	92	30	20
AGF4-20R2	10		20	2	0	11°19'	R	H6	20	60	80	88	92	30	20
AGF4-25R1	25		25	1	0	5°43'	R	H6	20	65	100	108	112	30	20
AGF4-30R1	30		30	1	0	5°43'	R	H8	20	65	120	128	132	30	20
AGF4-30R2	15		30	2	0	11°19'	R	H8	20	65	120	128	132	30	20
AGF4-36R1	36		36	1	0	5°43'	R	H9	20	70	144	152	156	30	20
AGF4-40R1	40		40	1	0	5°43'	R	H9	20	80	160	168	172	30	20
AGF4-48R1	48		48	1	0	5°43'	R	H9	20	90	192	200	204	30	20
AGF4-50R1	50		50	1	0	5°43'	R	H9	20	90	200	208	212	30	20
AGF4-60R1	60		60	1	0	5°43'	R	H0	160	—	240	248	252	30	7

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.



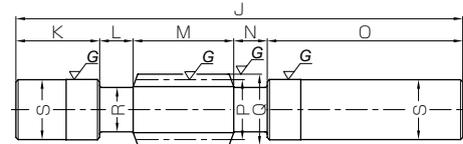
KWG Ground Worm Shafts



Module 5、6



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG5-R1	m5	1	5°43'	R	W6	400	75	30	90	30	175	50
KWG6-R1	m6	1	5°43'	R	W6	400	60	40	100	40	160	60

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.



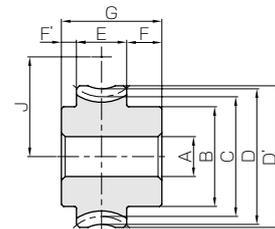
AGF Worm Wheels



Module 5、6



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A& BC2) *
Heat treatment	—
Tooth hardness	—



* H8, H9 shape have a hub made from FC200 cast iron.

H6

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Profile shift coefficient	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									A _{H7}	B	C	D	D'	E	F
AGF5-20R1	20	m5	20	1	0	5°43'	R	H6	22	75	100	110	115	35	23
AGF5-25R1	25		25	1	0	5°43'	R	H6	22	75	125	135	140	35	23
AGF5-30R1	30		30	1	0	5°43'	R	H8	22	75	150	160	165	35	23
AGF5-36R1	36		36	1	0	5°43'	R	H9	22	90	180	190	195	35	23
AGF5-40R1	40		40	1	0	5°43'	R	H9	22	110	200	210	215	35	23
AGF5-48R1	48		48	1	0	5°43'	R	H0	140	—	240	250	255	35	7.5
AGF5-50R1	50	50	1	0	5°43'	R	H0	150	—	250	260	265	35	7.5	
AGF5-60R1	60	60	1	0	5°43'	R	H0	200	—	300	310	315	35	7.5	
AGF6-20R1	20	m6	20	1	0	5°43'	R	H6	25	85	120	132	138	40	23
AGF6-25R1	25		25	1	0	5°43'	R	H6	25	90	150	162	168	40	23
AGF6-30R1	30		30	1	0	5°43'	R	H8	25	100	180	192	198	40	23
AGF6-36R1	36		36	1	0	5°43'	R	H9	25	110	216	228	234	40	23
AGF6-40R1	40		40	1	0	5°43'	R	H0	130	—	240	252	258	40	8
AGF6-48R1	48		48	1	0	5°43'	R	H0	180	—	288	300	306	40	8
AGF6-50R1	50	50	1	0	5°43'	R	H0	190	—	300	312	318	40	8	
AGF6-60R1	60	60	1	0	5°43'	R	H0	250	—	360	372	378	40	8	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.

③ For H0-shaped products with a bore size of φ 190 or more, the bore tolerance is H8.

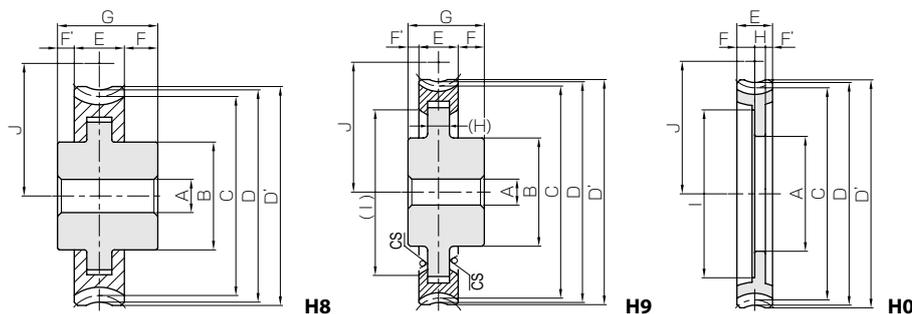
Ground Worm Shafts

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
60	36	50.2	5.75	KWG5-R1
72	44	60.2	8.09	KWG6-R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AGF

Worm Wheels



* CS has a sand mold casting finish.

NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width (L)	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1								Backlash (mm)	Weight (kg)	Catalog No.
					30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}				
F'	G	(H)	(I)	J											
12	70	—	—	75	211	172	134	108	95.0	86.2	72.7	0.22~0.35	3.26	AGF5-20R1	
12	70	—	—	87.5	319	261	206	168	147	134	114	0.22~0.35	4.48	AGF5-25R1	
12	70	(25)	(115)	100	446	369	291	239	211	191	164	0.22~0.35	5.37	AGF5-30R1	
12	70	(25)	(140)	115	627	519	414	343	302	274	234	0.22~0.35	7.70	AGF5-36R1	
12	70	(26)	(162)	125	763	632	506	421	371	337	288	0.22~0.35	9.97	AGF5-40R1	
17.5	35	10	195	145	1070	886	715	598	530	483	411	0.22~0.35	5.04	AGF5-48R1	
17.5	35	10	205	150	1150	956	772	646	574	523	446	0.22~0.35	5.28	AGF5-50R1	
17.5	35	10	255	175	1610	1340	1090	913	820	744	639	0.22~0.35	6.48	AGF5-60R1	
12	75	—	—	90	329	268	208	167	146	131	110	0.24~0.37	4.95	AGF6-20R1	
12	75	—	—	105	497	405	319	259	227	204	173	0.24~0.37	7.14	AGF6-25R1	
12	75	(30)	(135)	120	696	572	451	368	325	290	248	0.24~0.37	9.21	AGF6-30R1	
12	75	(30)	(172)	138	978	806	641	528	466	417	355	0.24~0.37	12.5	AGF6-36R1	
20	40	12	190	150	1190	981	784	648	572	513	436	0.24~0.37	6.20	AGF6-40R1	
20	40	12	240	174	1670	1380	1110	920	816	735	628	0.24~0.37	7.58	AGF6-48R1	
20	40	12	250	180	1800	1480	1200	994	885	796	676	0.24~0.37	8.00	AGF6-50R1	
20	40	12	310	210	2520	2090	1680	1410	1260	1130	969	0.24~0.37	10.0	AGF6-60R1	

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



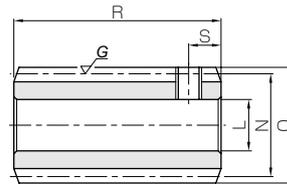
SWG Ground Worms



Module 1、1.5



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50 ~ 60HRC



W2

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M	N	O	P	Q	Q'
SWG1-R1 SWG1-R2	m1	1	3°35'	R	W2	8	—	16	18	—	—	—
		2	7°08'	R	W2	8	—	16	18	—	—	—
SWG1.5-R1 ● SWG1.5-R1J10	m1.5	1	3°26'	R	W1 W1K	10 10	20	25	28	30	10	—
SWG1.5-R2 ● SWG1.5-R2J10		2	6°51'	R	W1 W1K	10 10	20	25	28	30	10	—

- [Caution on Product Characteristics] ① For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
② These worms produce axial thrust forces. See Page 344 for more details.

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).



AG Worm Wheels

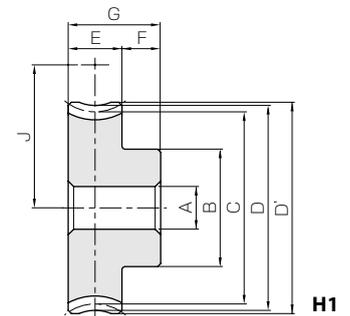


Module 1、1.5



Specifications		
Precision grade	KHK W 002 grade 2	
Reference section of gear	Rotating plane	
Gear teeth	Standard full depth	
Normal pressure angle	20°	
Material	CAC702 (formerly JIS A ∥ BC2)	
Heat treatment	—	
Tooth hardness	—	
Module	m1	m1.5
Face width (E)	10	14
Hub width (F)	10	10
Total length (G)	20	24
Screw offset (L)	5	5

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1

* The precision grade of J Series products is equivalent to the value shown in the table.

NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)
													30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm		
AG1-20R1	20	20	1	3°35'	R	H1	6	16	20	22	23	18	3.35	2.79	2.23	1.83	1.63	1.50	1.30	0.08~0.19	0.038
AG1-20R2	10	20	2	7°08'	R	H1	6	16	20	22	23	18	3.31	2.69	2.06	1.68	1.48	1.35	1.15	0.08~0.19	0.038
AG1-30R1	30	30	1	3°35'	R	H1	6	20	30	32	33	23	7.08	5.98	4.84	4.05	3.63	3.31	2.92	0.08~0.19	0.078
AG1-30R2	15	30	2	7°08'	R	H1	6	20	30	32	33	23	7.03	5.84	4.56	3.72	3.33	3.03	2.63	0.08~0.19	0.078
AG1-40R1	40	40	1	3°35'	R	H1	8	26	40	42	43	28	12.1	10.2	8.43	7.12	6.38	5.86	5.13	0.08~0.19	0.13
AG1-50R1	50	50	1	3°35'	R	H1	8	30	50	52	53	33	18.3	15.5	12.9	10.9	9.87	9.09	7.95	0.08~0.19	0.20
AG1-60R1	60	60	1	3°35'	R	H1	10	35	60	62	63	38	25.6	21.8	18.1	15.4	14.1	12.9	11.4	0.08~0.19	0.29
AG1.5-20R1	20	20	1	3°26'	R	H1	8	22	30	33	34.5	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0.10~0.21	0.10
AG1.5-20R2	10	20	2	6°51'	R	H1	8	22	30	33	34.5	27.5	9.72	7.87	5.92	4.87	4.25	3.83	3.27	0.10~0.21	0.10
AG1.5-30R1	30	30	1	3°26'	R	H1	10	30	45	48	49.5	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0.10~0.21	0.22
AG1.5-30R2	15	30	2	6°51'	R	H1	10	30	45	48	49.5	35	20.7	17.1	13.1	10.8	9.56	8.58	7.46	0.10~0.21	0.22
AG1.5-40R1	40	40	1	3°26'	R	H1	12	35	60	63	64.5	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0.10~0.21	0.37
AG1.5-50R1	50	50	1	3°26'	R	H1	12	45	75	78	79.5	50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0.10~0.21	0.59
AG1.5-60R1	60	60	1	3°26'	R	H1	12	50	90	93	94.5	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0.10~0.21	0.83

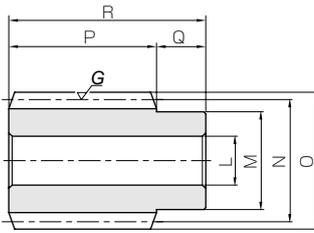
- [Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

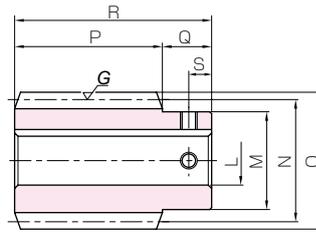
J Series



Ground Worms



W1



W1K



Total length R	Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
32	—	M4	5	0.037	SWG1-R1
32	—	M4	5	0.037	SWG1-R2
40	—	—	—	0.12	SWG1.5-R1
40	4 x 1.8	M4	5	0.11	● SWG1.5-R1J10
40	—	—	—	0.12	SWG1.5-R2
40	4 x 1.8	M4	5	0.11	● SWG1.5-R2J10



[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

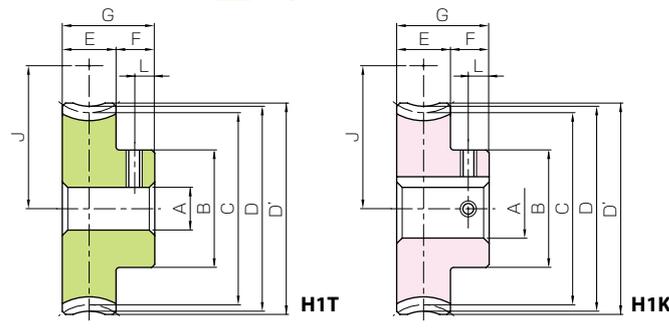
AG

J Series



Worm Wheels

Newly added



To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7	* The product shapes of J Series items are identified by background color.														
Keyway Js9	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30
Screw size	—		4 x 1.8			5 x 2.3			6 x 2.8			8 x 3.3			
Catalog No.	M4	M5	M4			M5			M6						
AG1-20R1 J BORE															
AG1-20R2 J BORE															
AG1-30R1 J BORE															
AG1-30R2 J BORE															
AG1-40R1 J BORE															
AG1-50R1 J BORE															
AG1-60R1 J BORE															
AG1.5-20R1 J BORE															
AG1.5-20R2 J BORE															
AG1.5-30R1 J BORE															
AG1.5-30R2 J BORE															
AG1.5-40R1 J BORE															
AG1.5-50R1 J BORE															
AG1.5-60R1 J BORE															

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ The use of H1T shaped Set Screws for fastening gears to a shaft is a method only applicable to the usage for light loads. For secure fastening, please use dowel pins in combination.



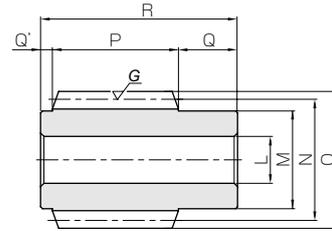
SWG Ground Worms



Module 2, 2.5



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50 ~ 60HRC



W3

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						LH7	M	N	O	P	Q	Q'
SWG2-R1 ● SWG2-R1J12 ● SWG2-R1J14	m2	1	3°41'	R	W3 W3K W3K	12	25	31	35	32	15	3
12						25	31	35	32	15	3	
SWG2-R2 ● SWG2-R2J12 ● SWG2-R2J14	m2	2	7°21'	R	W3 W3K W3K	12	25	31	35	32	15	3
12						25	31	35	32	15	3	
SWG2.5-R1 ● SWG2.5-R1J15 ● SWG2.5-R1J16 ● SWG2.5-R1J17	m2.5	1	3°52'	R	W3 W3K W3K	15	30	37	42	45	17	3
15						30	37	42	45	17	3	
SWG2.5-R2 ● SWG2.5-R2J15 ● SWG2.5-R2J16 ● SWG2.5-R2J17	m2.5	2	7°42'	R	W3 W3K W3K	15	30	37	42	45	17	3
15						30	37	42	45	17	3	

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



AG Worm Wheels



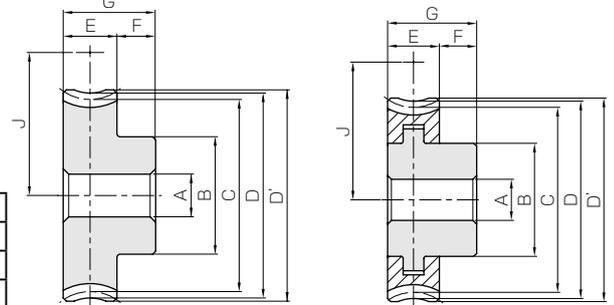
Module 2, 2.5



Specifications	
Precision grade	KHK W 002 grade 2 *
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A1/BC2) **
Heat treatment	—
Tooth hardness	—
Module	m2 m2.5
Face width (E)	18 20
Hub width (F)	15 14
Total length (G)	33 34
Screw offset (L)	7.5 7

AH7	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance

* The precision grade of J Series products is equivalent to the value shown in the table.
** H4, H5 shape have a hub made from FC200 cast iron.



H1

H4

NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	AH7	B	C	D	D'	(H)	(I)	J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm		
AG2-20R1	20	20	1	3°41'		H1		33	40	44	46			35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0.11~0.24	0.26
AG2-20R2	10	20	2	7°21'		H1		33	40	44	46			35.5	20.7	16.8	12.6	10.3	8.93	8.05	6.89		
AG2-30R1	30	30	1	3°41'		H4		40	60	64	66	—	—	45.5	44.3	37.3	29.6	24.8	21.9	19.8	17.4		
AG2-30R2	15	30	2	7°21'		H4	12	40	60	64	66			45.5	44.0	36.5	27.8	22.8	20.1	18.0	15.7		
AG2-40R1	40	40	1	3°41'		H4		45	80	84	86			55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7		
AG2-50R1	50	50	1	3°41'		H5		50	100	104	106	(8)	(83)	65.5	115	96.8	78.4	66.9	59.5	54.2	47.6	1.05	
AG2-60R1	60	60	1	3°41'		H5		55	120	124	126	(11)	(100)	75.5	160	136	110	94.6	84.9	77.2	68.1	1.52	
AG2.5-20R1	20	20	1	3°52'		H1	12	35	50	55	57.5	—	—	43.5	34.6	28.5	22.3	18.3	16.0	14.6	12.5	0.14~0.27	0.39
AG2.5-20R2	10	20	2	7°42'		H1	12	35	50	55	57.5	—	—	43.5	34.2	27.4	20.6	16.8	14.5	13.1	11.1		
AG2.5-30R1	30	30	1	3°52'		H4	12	40	75	80	82.5	—	—	56	73.2	61.0	48.3	40.5	35.5	32.2	28.1		
AG2.5-30R2	15	30	2	7°42'		H4	12	40	75	80	82.5	—	—	56	72.7	59.6	45.5	37.2	32.6	29.4	25.3		
AG2.5-40R1	40	40	1	3°52'		H5	15	45	100	105	107.5	(11)	(81)	68.5	125	105	84.0	71.2	62.5	57.0	49.5		
AG2.5-50R1	50	50	1	3°52'		H5	15	55	125	130	132.5	(12)	(106)	81	189	158	128	109	96.7	88.5	76.7	1.70	
AG2.5-60R1	60	60	1	3°52'		H5	15	60	150	155	157.5	(12)	(130)	93.5	265	222	180	154	138	126	110	2.32	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.

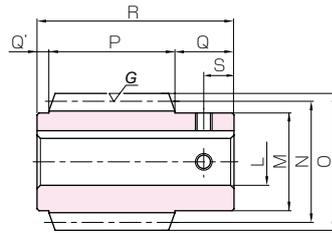
[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



Ground Worms



W3K



Total length R	Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
50	4 x 1.8 5 x 2.3	M4	7.5	0.21	SWG2-R1
			7.5	0.21	● SWG2-R1J12
			7.5	0.19	● SWG2-R1J14
50	4 x 1.8 5 x 2.3	M4	7.5	0.21	SWG2-R2
			7.5	0.21	● SWG2-R2J12
			7.5	0.19	● SWG2-R2J14
65	5 x 2.3 5 x 2.3 5 x 2.3	M4	8.5	0.40	SWG2.5-R1
			8.5	0.39	● SWG2.5-R1J15
			8.5	0.38	● SWG2.5-R1J16
65	5 x 2.3 5 x 2.3 5 x 2.3	M4	8.5	0.37	SWG2.5-R2
			8.5	0.39	● SWG2.5-R2J15
			8.5	0.38	● SWG2.5-R2J16
65	5 x 2.3 5 x 2.3 5 x 2.3	M4	8.5	0.37	SWG2.5-R1
			8.5	0.39	● SWG2.5-R1J15
			8.5	0.38	● SWG2.5-R1J16

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

[Caution on J series]

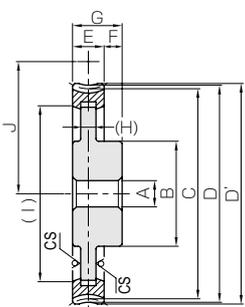
- ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

AG

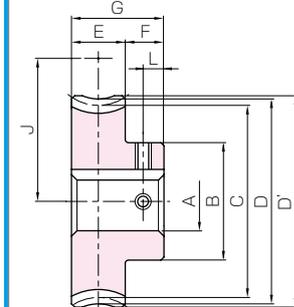


Worm Wheels

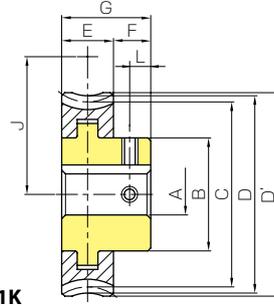
Newly added



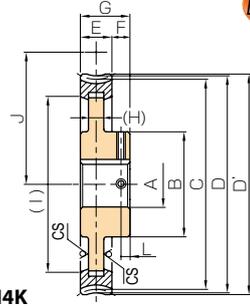
H5



H1K



H4K



H5K

To order J Series products, please specify; Catalog No. + J + BORE

Bore H7	* The product shapes of J Series items are identified by background color.															
Keyway Js9	12	14	15	16	17	18	19	20	22	25	28	30	32	35		
Screw size	4 x 1.8			5 x 2.3			6 x 2.8			8 x 3.3			10 x 3.3			
Catalog No.	M4				M5				M6				M8			
AG2-20R1 J BORE																
AG2-20R2 J BORE																
AG2-30R1 J BORE																
AG2-30R2 J BORE																
AG2-40R1 J BORE																
AG2-50R1 J BORE																
AG2-60R1 J BORE																
AG2.5-20R1 J BORE																
AG2.5-20R2 J BORE																
AG2.5-30R1 J BORE																
AG2.5-30R2 J BORE																
AG2.5-40R1 J BORE																
AG2.5-50R1 J BORE																
AG2.5-60R1 J BORE																

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
- ⑤ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



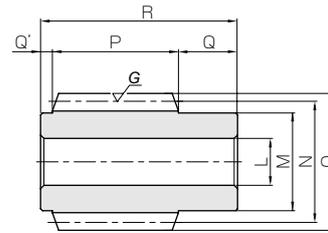
SWG Ground Worms



Module 3, 4



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50 ~ 60HRC



W3

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						LH7	M					
SWG3-R1 ● SWG3-R1J17 ● SWG3-R1J18 ● SWG3-R1J19 ● SWG3-R1J20	m3	1	3°54'	R	W3	16	35	44	50	50	20	4
						W3K						
						17						
						18						
						19						
SWG3-R2 ● SWG3-R2J17 ● SWG3-R2J18 ● SWG3-R2J19 ● SWG3-R2J20	m3	2	7°46'	R	W3	16	35	44	50	50	20	4
						W3K						
						17						
						18						
						19						
SWG3-R3 ● SWG3-R3J17 ● SWG3-R3J18 ● SWG3-R3J19 ● SWG3-R3J20	m3	3	11°34'	R	W3	16	35	44	50	50	20	4
						W3K						
						17						
						18						
						19						
SWG4-R1 SWG4-R2 SWG4-R3	m4	1	3°41'	R	W3	22	50	62	70	70	25	5
						W3						
						22						

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



AG Worm Wheels



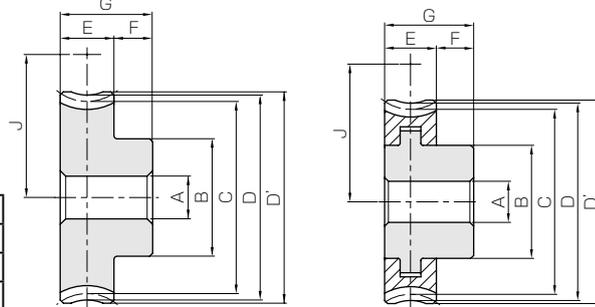
Module 3, 4



Specifications	
Precision grade	KHK W 002 grade 2 *
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A1/BC2) **
Heat treatment	—
Tooth hardness	—
Module	m3 m4
Face width (E)	25 30
Hub width (F)	18 20
Total length (G)	43 50
Screw offset (L)	9 —

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance

* The precision grade of J Series products is equivalent to the value shown in the table.
** * H4, H5 shape have a hub made from FC200 cast iron.



H1

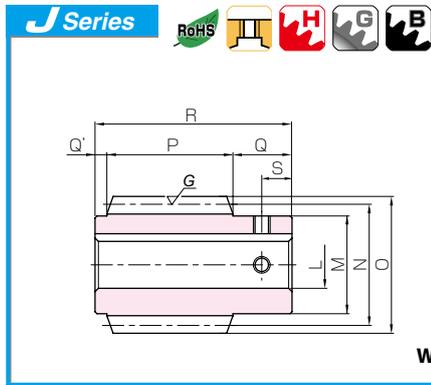
H4

NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	(H)	(I)	J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
AG3-20R1	20	20	1	3°54'		H1	50	60	66	69				52	59.5	48.8	38.0	30.9	27.0	24.7	20.9	0.16~0.29	0.75	
AG3-20R2	10	20	2	7°46'		H1	50	60	66	69				52	58.7	46.9	35.1	28.4	24.5	22.2	18.5		0.75	
AG3-30R1	30	30	1	3°54'		H4	55	90	96	99	—	—	—	67	126	104.3	82.4	68.4	59.9	54.5	46.9		1.46	
AG3-30R2	15	30	2	7°46'		H4	55	90	96	99				67	125	102	77.6	62.8	55.1	49.7	42.2		1.46	
AG3-30R3	10	30	3	11°34'		H4	55	90	96	99				67	129	103	77.1	62.4	53.8	48.7	40.6	1.46		
AG3-40R1	40	40	1	3°54'		H5	65	120	126	129	(10)	(103)		82	215	179	143	120	106	96.4	82.5	0.19~0.32	2.03	
AG3-45R3	15	45	3	11°34'			(11)	(120)	89.5	274	224	171	138	121	109	92.6					2.44			
AG3-50R1	50	50	1	3°54'			(15)	(130)	97	325	270	219	185	163	150	128					3.22			
AG3-60R1	60	60	1	3°54'			(15)	(155)	112	455	380	308	261	233	183						4.52			
AG3-60R3	10	30	3	7°21'																				
AG4-20R1	20	20	1	3°41'		H1	60	80	88	92				71	115	93.6	72.7	58.2	51.1	45.7	38.4	0.19~0.32	1.53	
AG4-20R2	10	20	2	7°21'				60	80	88	92				71	114	90.0	67.2	53.5	46.4	41.2		34.1	1.53
AG4-30R1	30	30	1	3°41'				65	120	128	132	—	—		91	244	200	158	129	114	101		86.3	3.00
AG4-30R2	15	30	2	7°21'				65	120	128	132				91	242	196	148	118	104	92.2		77.6	3.00
AG4-30R3	10	30	3	10°57'				65	120	128	132				91	250	198	147	117	102	90.2		74.7	3.00
AG4-40R1	40	40	1	3°41'		H5	80	160	168	172	(15)	(133)		111	417	343	274	226	200	179	152	0.19~0.32	4.32	
AG4-45R3	15	45	3	10°57'			(16)	(153)	121	531	430	326	259	229	202	170							5.44	
AG4-50R1	50	50	1	3°41'			(16)	(173)	131	630	519	418	347	309	277	236							6.25	
AG4-60R1	60	60	1	3°41'			(17)	(210)	151	881	730	589	491	441	395	337							8.74	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.



Ground Worms



W3K

Total length R	Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
74	5 × 2.3 6 × 2.8 6 × 2.8 6 × 2.8	M4	10	0.66	● SWG3-R1
		M5	10	0.64	● SWG3-R1J17
		M5	10	0.62	● SWG3-R1J18
		M5	10	0.60	● SWG3-R1J19
74	5 × 2.3 6 × 2.8 6 × 2.8 6 × 2.8	M4	10	0.66	● SWG3-R2
		M5	10	0.64	● SWG3-R2J17
		M5	10	0.62	● SWG3-R2J18
		M5	10	0.60	● SWG3-R2J19
74	5 × 2.3 6 × 2.8 6 × 2.8 6 × 2.8	M4	10	0.66	● SWG3-R3
		M5	10	0.64	● SWG3-R3J17
		M5	10	0.62	● SWG3-R3J18
		M5	10	0.58	● SWG3-R3J20
100	—	—	—	1.82	● SWG4-R1
100	—	—	—	1.82	● SWG4-R2
100	—	—	—	1.82	● SWG4-R3

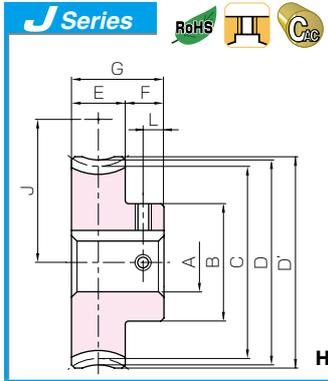
[Caution on J series]

- As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Areas of products which have been re-worked will not be black oxide coated.
- For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

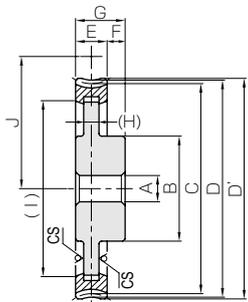
- Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. vvv).

AG



Worm Wheels

Newly added



H5

H1K

H4K

H5K

To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7	* The product shapes of J Series items are identified by background color.									
Keyway Js9	20	22	25	28	30	32	35	40	45	50
Screw size	6 × 2.8		8 × 3.3			10 × 3.3		12 × 3.3		14 × 3.8
Catalog No.	M5			M6			M8		M10	
AG3-20R1 J BORE										
AG3-20R2 J BORE										
AG3-30R1 J BORE										
AG3-30R2 J BORE										
AG3-30R3 J BORE										
AG3-40R1 J BORE										
AG3-45R3 J BORE										
AG3-50R1 J BORE										
AG3-60R1 J BORE										

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

[Caution on J series]

- As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
- For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



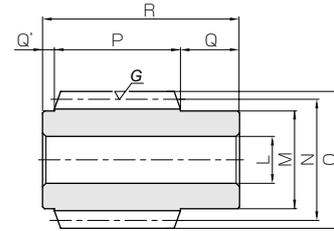
SWG Ground Worms



Module 5, 6



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50 ~ 60HRC



W3

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M	N	O	P	Q	Q'
SWG5-R1	m5	1	4°05'	R	W3	25	56	70	80	85	30	5
SWG5-R2		2	8°08'	R	W3	25	56	70	80	85	30	5
SWG6-R1	m6	1	4°17'	R	W3	30	63	80	92	100	35	5
SWG6-R2		2	8°32'	R	W3	30	63	80	92	100	35	5

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.



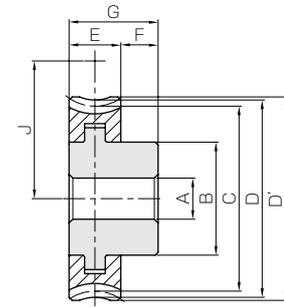
AG Worm Wheels



Module 5, 6



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



* H4, H5 shape have a hub made from FC200 cast iron.

H4

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
AG5-20R1	20	m5	20	1	4°05'	R	H4	22	75	100	110	115	35
AG5-20R2	10		20	2	8°08'	R	H4	22	75	100	110	115	35
AG5-30R1	30		30	1	4°05'	R	H5	22	75	150	160	165	35
AG5-30R2	15		30	2	8°08'	R	H5	22	75	150	160	165	35
AG5-40R1	40		40	1	4°05'	R	H5	22	110	200	210	215	35
AG5-50R1	50	m6	50	1	4°05'	R	H5	22	120	250	260	265	35
AG5-60R1	60		60	1	4°05'	R	H5	22	130	300	310	315	35
AG6-20R1	20		20	1	4°17'	R	H4	25	85	120	132	138	40
AG6-20R2	10		20	2	8°32'	R	H4	25	85	120	132	138	40
AG6-30R1	30		30	1	4°17'	R	H5	25	100	180	192	198	40
AG6-30R2	15	30	2	8°32'	R	H5	25	100	180	192	198	40	
AG6-40R1	40	40	1	4°17'	R	H5	25	120	240	252	258	40	
AG6-50R1	50	m6	50	1	4°17'	R	H5	25	130	300	312	318	40
AG6-60R1	60		60	1	4°17'	R	H5	25	150	360	372	378	40

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.

Total length R	Set Screw		Weight (kg)	Catalog No.
	Size	S		
120	—	—	2.78	SWG5-R1
120	—	—	2.78	SWG5-R2
140	—	—	4.15	SWG6-R1
140	—	—	4.15	SWG6-R2

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

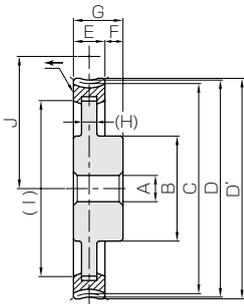
Worm Gear Pair

Bevel Gearboxes

Other Products

AG

Worm Wheels



H5



NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N-m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
25	60	—	—	85	202	163	127	101	88.4	79.0	65.5	0.22~0.35	2.79	AG5-20R1
25	60	—	—	85	200	157	117	93.2	80.2	71.1	58.1	0.22~0.35	2.79	AG5-20R2
25	60	(21)	(120)	110	427	348	275	224	196	175	147	0.22~0.35	4.75	AG5-30R1
25	60	(21)	(120)	110	425	340	259	206	180	159	132	0.22~0.35	4.75	AG5-30R2
25	60	(23)	(168)	135	731	597	478	394	346	309	259	0.22~0.35	8.84	AG5-40R1
25	60	(23)	(215)	160	1110	903	729	605	534	479	402	0.22~0.35	12.7	AG5-50R1
25	60	(24)	(260)	185	1550	1270	1030	855	763	682	575	0.22~0.35	17.6	AG5-60R1
30	70	—	—	100	315	252	196	157	135	121	99.6	0.24~0.37	4.53	AG6-20R1
30	70	—	—	100	314	244	182	145	124	110	89.3	0.24~0.37	4.53	AG6-20R2
30	70	(26)	(142)	130	666	538	424	346	300	267	224	0.24~0.37	8.52	AG6-30R1
30	70	(26)	(142)	130	668	532	403	321	278	246	203	0.24~0.37	8.52	AG6-30R2
30	70	(28)	(200)	160	1140	923	738	609	528	472	394	0.24~0.37	14.2	AG6-40R1
30	70	(30)	(258)	190	1720	1400	1130	935	816	733	611	0.24~0.37	21.0	AG6-50R1
30	70	(30)	(312)	220	2410	1960	1580	1320	1170	1040	875	0.24~0.37	29.7	AG6-60R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



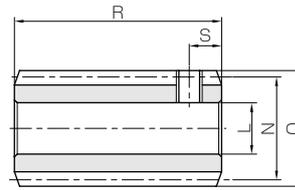
SW Steel Worms



Module 0.5, 0.8



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W2

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H8}	M	N	O	P	Q	Q'
SW0.5-R1	m0.5	1	2°36'	R	W2	5	—	11	12	—	—	—
SW0.5-R2		2	5°13'	R	W2	5	—	11	12	—	—	—
SW0.8-R1	m0.8	1	3°17'	R	W2	6	—	14	15.6	—	—	—
SW0.8-R2		2	6°34'	R	W2	6	—	14	15.6	—	—	—

[Caution on Product Characteristics]

- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- These worms produce axial thrust forces. See Page 344 for more details.



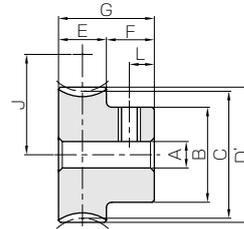
BG Bronze Worm Wheels



Module 0.5, 0.8



Specifications	
Precision grade	KHK W 002 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC502 (formerly JIS PBC2)
Heat treatment	—
Tooth hardness	—



HAT

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
BG0.5-20R1	20	m0.5	20	1	2°36'	R	HAT	4	9	10.01	—	11	5
BG0.5-20R2	10		20	2	5°13'	R	HAT	4	9	10.04	—	11	5
BG0.5-30R1	30		30	1	2°36'	R	HAT	4	12	15.02	—	16	5
BG0.5-30R2	15		30	2	5°13'	R	HAT	4	12	15.06	—	16	5
BG0.5-40R1	40		40	1	2°36'	R	HAT	5	15	20.02	—	21	5
BG0.5-50R1	50	m0.5	50	1	2°36'	R	HAT	5	20	25.03	—	26	5
BG0.5-60R1	60		60	1	2°36'	R	HAT	5	25	30.03	—	31	5

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
BG0.8-20R1	20	m0.8	20	1	3°17'	R	HA	5	12	16.03	—	17.6	9
BG0.8-20R2	10		20	2	6°34'	R	HA	5	12	16.11	—	17.6	9
BG0.8-30R1	30		30	1	3°17'	R	HA	5	18	24.04	—	25.6	9
BG0.8-30R2	15		30	2	6°34'	R	HA	5	18	24.16	—	25.6	9
BG0.8-40R1	40		40	1	3°17'	R	HA	6	20	32.05	—	33.6	9
BG0.8-50R1	50	m0.8	50	1	3°17'	R	HA	8	25	40.06	—	41.6	9
BG0.8-60R1	60		60	1	3°17'	R	HA	8	25	48.08	—	49.6	9

[Caution on Product Characteristics]

- Worm Wheels are profile shifted to create the proper center distance.
- For products with a tapped hole, a set screw is included.
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.
- If bore size is less than $\varphi 4$, the diameter tolerance is H8. If bore size is $\varphi 5$ or $\varphi 6$, and the hole length exceeds 3 times the diameter, the tolerance is also H8.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.

Total length R	Set Screw		Weight (kg)	Catalog No.
	Size	S		
18	M3	3	0.010	SW0.5-R1
18	M3	3	0.010	SW0.5-R2
30	M4	5	0.029	SW0.8-R1
30	M4	5	0.029	SW0.8-R2

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 - ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

Spur Gears

Helical Gears

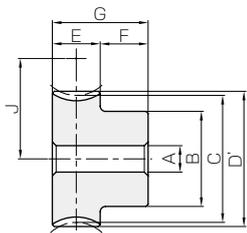
Internal Gears

Racks

CP Racks & Pinions

BG

Bronze Worm Wheels



HA



NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width F	Total length G	Mounting distance J	Set Screw		Allowable torque (N-m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			Size	L	30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}			
7	12	10.5	M3	3.5	0.27	0.23	0.19	0.15	0.14	0.13	0~0.16	0.0061	BG0.5-20R1
7	12	10.5	M3	3.5	0.28	0.23	0.18	0.15	0.13	0.12	0~0.16	0.0061	BG0.5-20R2
7	12	13	M3	3.5	0.58	0.50	0.41	0.34	0.30	0.28	0~0.16	0.014	BG0.5-30R1
7	12	13	M3	3.5	0.59	0.49	0.39	0.32	0.29	0.26	0~0.16	0.014	BG0.5-30R2
7	12	15.5	M4	3.5	0.99	0.85	0.71	0.60	0.54	0.50	0~0.16	0.023	BG0.5-40R1
7	12	18	M4	3.5	1.50	1.28	1.08	0.92	0.83	0.77	0~0.16	0.039	BG0.5-50R1
7	12	20.5	M4	3.5	2.10	1.80	1.52	1.31	1.19	1.09	0~0.16	0.059	BG0.5-60R1

NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width F	Total length G	Mounting distance J	Allowable torque (N-m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}			
9	18	15	1.05	0.88	0.71	0.58	0.52	0.48	0.04~0.22	0.023	BG0.8-20R1
9	18	15	1.06	0.86	0.66	0.54	0.48	0.44	0.04~0.22	0.023	BG0.8-20R2
9	18	19	2.23	1.89	1.53	1.29	1.15	1.06	0.04~0.22	0.055	BG0.8-30R1
9	18	19	2.24	1.87	1.46	1.20	1.07	0.98	0.04~0.22	0.055	BG0.8-30R2
9	18	23	3.81	3.24	2.67	2.26	2.02	1.87	0.04~0.22	0.087	BG0.8-40R1
9	18	27	5.76	4.90	4.07	3.47	3.13	2.90	0.04~0.22	0.13	BG0.8-50R1
9	18	31	8.06	6.88	5.73	4.90	4.46	4.12	0.04~0.22	0.18	BG0.8-60R1

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



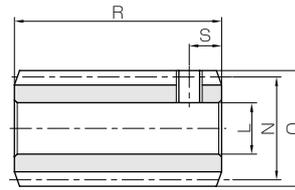
SW Steel Worms



Module 1, 1.25



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W2

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						LH7	M	N	O	P	Q	Q'
SW1-R1	m1	1	3°35'	R	W2	6	—	16	18	—	—	—
SW1-R2		2	7°11'	R	W2	6	—	16	18	—	—	—
SW1.25-R1	m1.25	1	3°25'	R	W2	8	—	21	23.5	—	—	—
SW1.25-R2		2	6°50'	R	W2	8	—	21	23.5	—	—	—

[Caution on Product Characteristics]

- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- These worms produce axial thrust forces. See Page 344 for more details.
- If bore size is less than $\phi 4$, the diameter tolerance is H8. If bore size is $\phi 5$ or $\phi 6$, and the hole length exceeds 3 times the diameter, the tolerance is also H8.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.



BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels

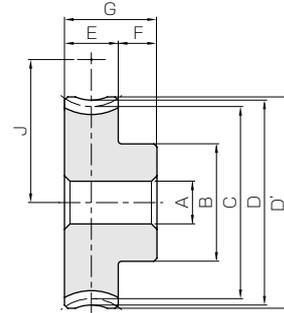


Module 1, 1.25



Specifications			
Catalog No.	BG	CG	
Precision grade	KHK W 002 grade 4 *		
Reference section of gear	Normal plane		
Gear teeth	Standard full depth		
Normal pressure angle	20°		
Material	CAC502 (formerly JIS PBC2)	FC200	
Heat treatment	—		
Tooth hardness	—		
Module	m1	m1.25	m1
Face width (E)	10	11	10
Hub width (F)	10	9	10
Total length (G)	20	20	20
Screw offset (L)	5	4.5	5

AH7	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1

* The precision grade of J Series products is equivalent to the value shown in the table.

NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	AH7	B	C	D	D'	J	Allowable torque (N·m) NOTE 1					Backlash (mm)	Weight (kg)		
													30 rpm	100 rpm	300 rpm	600 rpm	900 rpm			1200 rpm	
BG1-20R1	20	20	1	3°35'	R	H1	6	16	20.05	22	23	18	1.89	1.58	1.26	1.04	0.92	0.85	0.06~0.24	0.043	
BG1-20R2	10	20	2	7°11'	R		6	16	20.16	22	23	18	1.90	1.54	1.18	0.97	0.85	0.78			
BG1-30R1	30	30	1	3°35'	R		6	20	30.07	32	33	23	4.00	3.38	2.74	2.29	2.05	1.87			
BG1-30R2	15	30	2	7°11'	R		6	20	30.24	32	33	23	4.03	3.35	2.62	2.14	1.91	1.74	0.089	0.15	
BG1-40R1	40	40	1	3°35'	R		8	26	40.08	42	43	28	6.85	5.79	4.76	4.03	3.61	3.31			
BG1-50R1	50	50	1	3°35'	R		8	30	50.1	52	53	33	10.3	8.76	7.27	6.18	5.58	5.14	0.23		
BG1.25-20R1	20	20	1	3°25'	R		6	20	25.04	27.5	28.75	23	3.19	2.65	2.10	1.72	1.53	1.40	0.08~0.26	0.070	
BG1.25-20R2	10	20	2	6°50'	R		6	20	25.18	27.5	28.75	23	3.19	2.58	1.96	1.60	1.40	1.27			
BG1.25-30R1	30	30	1	3°25'	R		6	25	37.57	40	41.25	29.25	6.75	5.67	4.56	3.81	3.40	3.09			
BG1.25-30R2	15	30	2	6°50'	R		6	25	37.77	40	41.25	29.25	6.77	5.60	4.33	3.54	3.16	2.85	0.15	0.24	
BG1.25-40R1	40	40	1	3°25'	R		8	30	50.09	52.5	53.75	35.5	11.5	9.71	7.92	6.70	5.98	5.47			
BG1.25-50R1	50	50	1	3°25'	R		8	40	62.61	65	66.25	41.75	17.4	14.7	12.1	10.3	9.25	8.49	0.40		
CG1-60R1	60	60	1	3°35'	R	H1	10	30	60.12	62	63	38	8.69	7.39	6.14	5.24	4.78	4.39	0.06~0.24	0.25	
CG1-80R1	80	80					10	35	80.16	82	83	48	14.7	12.6	10.5	9.11	8.30	7.72			7.22
CG1-100R1	100	100					10	40	100.2	102	103	58	21.9	19.0	16.0	13.9	12.7	11.9			11.9
CG1-120R1	120	120					10	40	120.24	122	123	68	30.5	26.7	22.5	19.6	18.0	16.7	16.7	0.91	

[Caution on Product Characteristics]

- Worm Wheels are profile shifted to create the proper center distance.
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.
- If bore size is less than $\phi 4$, the diameter tolerance is H8. If bore size is $\phi 5$ or $\phi 6$, and the hole length exceeds 3 times the diameter, the tolerance is also H8.

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Total length	Set Screw		Weight (kg)	Catalog No.
	R	Size		
32	M4	5	0.043	SW1-R1
32	M4	5	0.043	SW1-R2
37	M5	5	0.085	SW1.25-R1
37	M5	5	0.085	SW1.25-R2

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG

J Series

Bronze Worm Wheels & Gray Iron Worm Wheels

Newly added

H1T

H1K

To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7	* The product shapes of J Series items are identified by background color.											
Keyway Js9	6	8	10	12	14	15	16	17	18	19	20	22
Screw size	—			4 × 1.8		5 × 2.3			6 × 2.8			
Catalog No.	M4	M5	M4					M5				
BG1-20R1 J Bore												
BG1-20R2 J Bore												
BG1-30R1 J Bore												
BG1-30R2 J Bore												
BG1-40R1 J Bore												
BG1-50R1 J Bore												
BG1.25-20R1 J Bore												
BG1.25-20R2 J Bore												
BG1.25-30R1 J Bore												
BG1.25-30R2 J Bore												
BG1.25-40R1 J Bore												
BG1.25-50R1 J Bore												
CG1-60R1 J Bore												
CG1-80R1 J Bore												
CG1-100R1 J Bore												
CG1-120R1 J Bore												

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ The use of H1T shaped Set Screws for fastening gears to a shaft is a method only applicable to the usage for light loads. For secure fastening, please use dowel pins in combination.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



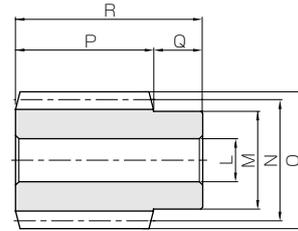
SW Steel Worms



Module 1.5



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W1

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						LH7	M	N	O	P	Q	Q'
SW1.5-R1 ● SW1.5-R1J8 ● SW1.5-R1J10	m1.5	1	3°26'	R	W1 W1T W1K	8	20	25	28	30	10	—
8						10						—
SW1.5-R2 ● SW1.5-R2J8 ● SW1.5-R2J10	m1.5	2	6°54'	R	W1 W1T W1K	8	20	25	28	30	10	—
8						10						—

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.



BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels



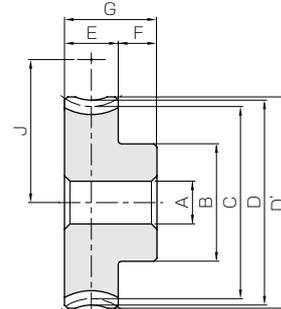
Module 1.5



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4 *	
Reference section of gear	Normal plane	
Gear teeth	Standard full depth	
Normal pressure angle	20°	
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	
Tooth hardness	—	
Hub width (F)	10	
Screw offset (L)	5	

* The precision grade of J Series products is equivalent to the value shown in the table.

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
G	Total length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1

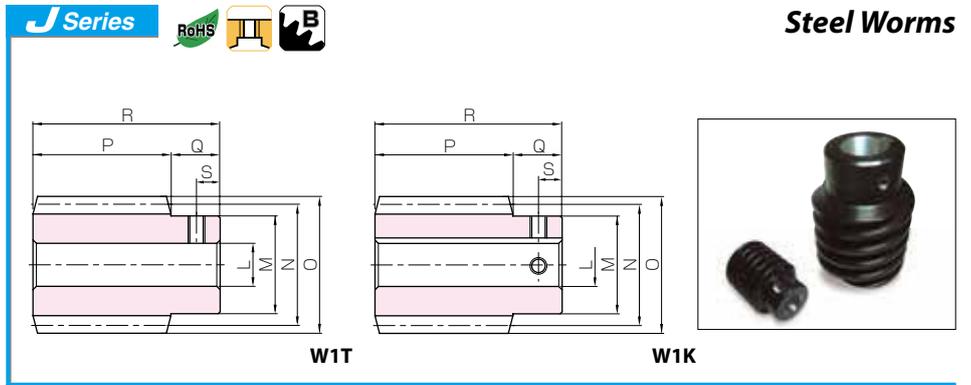
NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	E	G	J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm		
BG1.5-20R1	20	20	1	3°26'		R H1	8	22	30.05	33	34.5	12	22	27.5	4.76	3.96	3.10	2.56	2.27	2.06	0.08~0.26	0.10
BG1.5-20R2	10	20	2	6°54'			8	22	30.22	33	34.5	12	22	27.5	4.75	3.85	2.89	2.38	2.08	1.87		
BG1.5-30R1	30	30	1	3°26'			10	30	45.08	48	49.5	12	22	35	10.1	8.47	6.72	5.67	5.03	4.55		
BG1.5-30R2	15	30	2	6°54'			10	30	45.33	48	49.5	12	22	35	10.1	8.37	6.40	5.26	4.67	4.20		
BG1.5-40R1	40	40	1	3°26'			12	30	60.11	63	64.5	12	22	42.5	17.2	14.5	11.7	9.96	8.86	8.04		
BG1.5-50R1	50	50	1	3°26'			12	40	75.13	78	79.5	14	24	50	30.4	25.6	20.8	17.8	16.0	14.6		
CG1.5-30R1	30	30	1	3°26'			10	30	45.08	48	49.5	12	22	35	6.04	5.08	4.03	3.40	3.02	2.73		
CG1.5-40R1	40	40					12	30	60.11	63	64.5	12	22	42.5	10.3	8.71	7.01	5.98	5.31	4.83		
CG1.5-50R1	50	50					12	40	75.13	78	79.5	14	24	50	18.2	15.4	12.5	10.7	9.59	8.74		
CG1.5-60R1	60	60					12	40	90.16	93	94.5	14	24	57.5	25.5	21.6	17.6	15.1	13.7	12.4		
CG1.5-80R1	80	80				15	50	120.22	123	124.5	14	24	72.5	43.1	36.8	30.1	26.3	23.8	21.9			
CG1.5-80R1	80	80				15	50	120.22	123	124.5	14	24	72.5	43.1	36.8	30.1	26.3	23.8	21.9			
CG1.5-100R1	100	100				15	50	150.27	153	154.5	14	24	87.5	64.4	55.6	45.8	40.1	36.4	33.6			

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.

② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

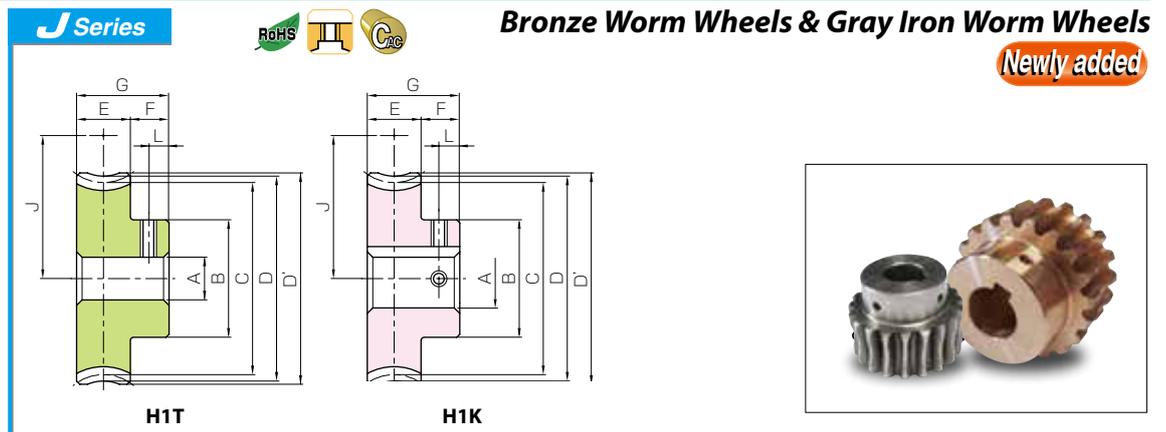


Steel Worms

Total length R	Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
40	—	—	—	0.12	SW1.5-R1
	4 x 1.8	M5	5	0.12	● SW1.5-R1J8
		M4	5	0.11	● SW1.5-R1J10
40	—	—	—	0.12	SW1.5-R2
	4 x 1.8	M5	5	0.12	● SW1.5-R2J8
		M4	5	0.11	● SW1.5-R2J10

- [Caution on J series]
- As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
 - Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
 - Keyways are made according to JIS B1301 standards, Js9 tolerance.
 - Areas of products which have been re-worked will not be black oxide coated.
 - For products having a tapped hole, a set screw is included.

BG • CG



Bronze Worm Wheels & Gray Iron Worm Wheels

Newly added

To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7	* The product shapes of J Series items are identified by background color.													
Keyway Js9	8	10	12	14	15	16	17	18	19	20	22	25	28	30
Screw size	4 x 1.8			5 x 2.3				6 x 2.8			8 x 3.3			
Catalog No.	M5			M4				M5			M6			
BG1.5-20R1 J BORE														
BG1.5-20R2 J BORE														
BG1.5-30R1 J BORE														
BG1.5-30R2 J BORE														
BG1.5-40R1 J BORE														
BG1.5-50R1 J BORE														
CG1.5-30R1 J BORE														
CG1.5-40R1 J BORE														
CG1.5-50R1 J BORE														
CG1.5-60R1 J BORE														
CG1.5-80R1 J BORE														
CG1.5-100R1 J BORE														

- [Caution on J series]
- As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
 - Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
 - Keyways are made according to JIS B1301 standards, Js9 tolerance.
 - Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
 - For products having a tapped hole, a set screw is included.
 - The use of H1T shaped Set Screws for fastening gears to a shaft is a method only applicable to the usage for light loads. For secure fastening, please use dowel pins in combination.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



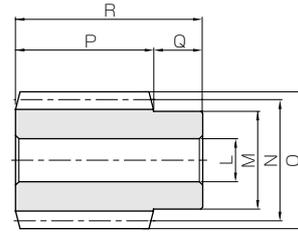
SW Steel Worms



Module 2



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W1

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M	N	O	P	Q	Q'
SW2-R1 ● SW2-R1J12 ● SW2-R1J14	m2	1	3°42'	R	W1 W1K W1K	12	25	31	35	32	14	—
						12						
						14						
SW2-R2 ● SW2-R2J12 ● SW2-R2J14		2	7°25'	R	W1 W1K W1K	12	25	31	35	32	14	—
						12						
						14						
SW2-L1 ● SW2-L1J12 ● SW2-L1J14	m2	1	3°42'	L	W1 W1K W1K	12	25	31	35	32	14	—
						12						
						14						
SW2-L2 ● SW2-L2J12 ● SW2-L2J14		2	7°25'	L	W1 W1K W1K	12	25	31	35	32	14	—
						12						
						14						

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels

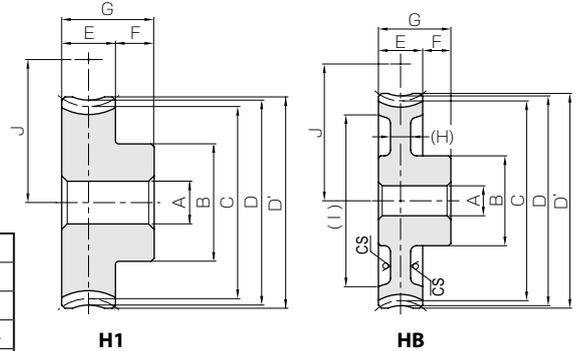


Module 2



Specifications	
Catalog No.	BG CG
Precision grade	KHK W 002 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	CAC502 (formerly JIS PBC2) FC200
Heat treatment	—
Tooth hardness	—
Face width (E)	22
Hub width (F)	13
Total length (G)	35
Screw offset (L)	6.5

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



**CS has a sand mold casting finish.

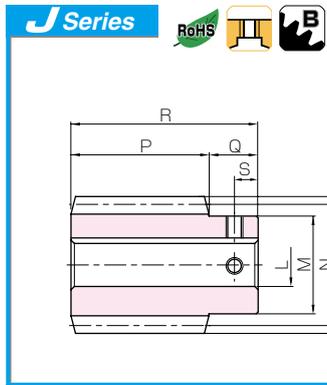
* The precision grade of J Series products is equivalent to the value shown in the table.

NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	(H)	(I)	J	Allowable torque (N·m) NOTE 1					Backlash (mm)	Weight (kg)								
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm			1200 rpm							
BG2-20R1	20	20	1	3°42'	R	H1	33	40.08	44	46	—	—	35.5	12.3	10.2	8.00	6.59	5.78	5.25	0.33	0.27								
BG2-20R2	10		2	7°25'				40.34														12.3	10.0	7.51	6.15	5.32	4.80		
BG2-20L1	20	20	1	3°42'	L	H1	33	40.08	44	46	—	—	35.5	12.3	10.2	8.00	6.59	5.78	5.25	0.33	0.27								
BG2-20L2	10		2	7°25'				40.34														12.3	10.0	7.51	6.15	5.32	4.80		
CG2-20R1	20	20	1	3°42'	R	H1	12	33	40.08	44	46	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.10~0.28	0.27							
CG2-20R2	10	20	2	7°25'				33	40.34	44	46												35.5	7.40	6.00	4.51	3.69	3.19	2.88
CG2-30R1	30	30	1	3°42'				40	60.13	64	66												45.5	15.6	13.1	10.4	8.74	7.70	6.96
CG2-30R2	15	30	2	7°25'				40	60.51	64	66												45.5	15.7	13.1	9.96	8.15	7.18	6.45
CG2-40R1	40	40	1	3°42'				45	80.17	84	86												55.5	26.7	22.5	18.1	15.4	13.55	12.3
CG2-50R1	50	50	1	3°42'				48	100.21	104	106												65.5	40.3	34.1	27.6	23.6	21.0	19.1
CG2-50R2	25	50	2	7°25'	48	100.84	104	106	(7)	(88)	(88)	65.5	40.7	34.0	26.9	22.4	19.6	17.8											
CG2-60R1	60	60	1	3°42'	60	120.25	124	126	75.5	56.4	47.9	38.9	33.3	29.9	27.2														
CG2-20L1	20	20	1	3°42'	L	H1	12	33	40.08	44	46	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.10~0.28	0.27							
CG2-20L2	10	20	2	7°25'				33	40.34	44	46												35.5	7.40	6.00	4.51	3.69	3.19	2.88
CG2-30L1	30	30	1	3°42'				40	60.13	64	66												45.5	15.6	13.1	10.4	8.74	7.70	6.96
CG2-30L2	15	30	2	7°25'				40	60.51	64	66												45.5	15.7	13.1	9.96	8.15	7.18	6.45
CG2-40L1	40	40	1	3°42'				45	80.17	84	86												55.5	26.7	22.5	18.1	15.4	13.55	12.3
CG2-50L1	50	50	1	3°42'				48	100.21	104	106												(7)	(88)	(88)	65.5	40.3	34.1	27.6
CG2-50L2	25	50	2	7°25'	48	100.84	104	106	(7)	(88)	(88)	65.5	40.7	34.0	26.9	22.4	19.6	17.8											
CG2-60L1	60	60	1	3°42'	60	120.25	124	126	(108)	75.5	56.4	47.9	38.9	33.3	29.9	27.2													

[Caution on Product Characteristics]

- ① Worm Wheels are profile shifted to create the proper center distance.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.



W1K

Steel Worms



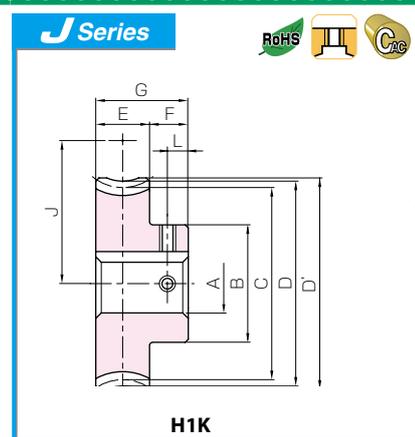
Total length R	Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
46	—	—	—	0.20	SW2-R1
	4 × 1.8	M4	7	0.20	● SW2-R1J12
	5 × 2.3	M4	7	0.18	● SW2-R1J14
46	—	—	—	0.20	SW2-R2
	4 × 1.8	M4	7	0.20	● SW2-R2J12
	5 × 2.3	M4	7	0.18	● SW2-R2J14
46	—	—	—	0.20	SW2-L1
	4 × 1.8	M4	7	0.20	● SW2-L1J12
	5 × 2.3	M4	7	0.18	● SW2-L1J14
46	—	—	—	0.20	SW2-L2
	4 × 1.8	M4	7	0.20	● SW2-L2J12
	5 × 2.3	M4	7	0.18	● SW2-L2J14

[Caution on J series]

- As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order**. Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Areas of products which have been re-worked will not be black oxide coated.
- For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG • CG



H1K

Bronze Worm Wheels & Gray Iron Worm Wheels

Newly added



To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7	* The product shapes of J Series items are identified by background color.													
Keyway Js9	12	14	15	16	17	18	19	20	22	25	28	30	32	35
Screw size	4 × 1.8	5 × 2.3				6 × 2.8				8 × 3.3		10 × 3.3		
Catalog No.	M4				M5				M6		M8			
BG2-20R1 J BORE														
BG2-20R2 J BORE														
BG2-20L1 J BORE														
BG2-20L2 J BORE														
CG2-20R1 J BORE														
CG2-20R2 J BORE														
CG2-30R1 J BORE														
CG2-30R2 J BORE														
CG2-40R1 J BORE														
CG2-50R1 J BORE														
CG2-50R2 J BORE														
CG2-60R1 J BORE														
CG2-20L1 J BORE														
CG2-20L2 J BORE														
CG2-30L1 J BORE														
CG2-30L2 J BORE														
CG2-40L1 J BORE														
CG2-50L1 J BORE														
CG2-50L2 J BORE														
CG2-60L1 J BORE														

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



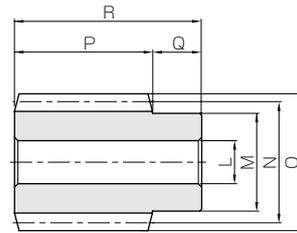
SW Steel Worms



Module 2.5



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W1

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						LH7	M					
SW2.5-R1 ● SW2.5-R1J15 ● SW2.5-R1J16 ● SW2.5-R1J17	m2.5	1	3°52'	R	W1	15	30	37	42	45	18	—
W1K					15 16 17							
SW2.5-R2 ● SW2.5-R2J15 ● SW2.5-R2J16 ● SW2.5-R2J17		2	7°46'	R	W1	15	30	37	42	45	18	—
W1K					15 16 17							
SW2.5-L1 ● SW2.5-L1J15 ● SW2.5-L1J16 ● SW2.5-L1J17	m2.5	1	3°52'	L	W1	15	30	37	42	45	18	—
W1K					15 16 17							
SW2.5-L2 ● SW2.5-L2J15 ● SW2.5-L2J16 ● SW2.5-L2J17		2	7°46'	L	W1	15	30	37	42	45	18	—
W1K					15 16 17							

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels

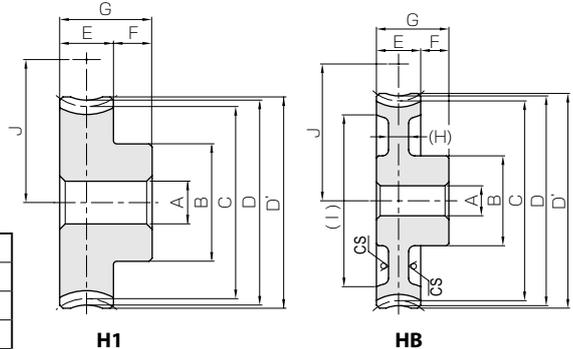


Module 2.5



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4 *	
Reference section of gear	Normal plane	
Gear teeth	Standard full depth	
Normal pressure angle	14° 30'	
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	
Tooth hardness	—	
Face width (E)	22	
Hub width (F)	14	
Total length (G)	36	
Screw offset (L)	7	

AH7	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



**CS has a sand mold casting finish.

* The precision grade of J Series products is equivalent to the value shown in the table.

NOTE 1 : Allowable torque for worm revolution (rpm)

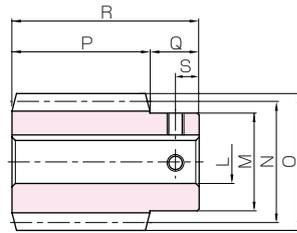
Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	AH7	B	C	D	D'	(H)	(I)	J	Allowable torque (N-m) NOTE 1						Backlash (mm)	Weight (kg)
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm		
BG2.5-20R1	20	20	1	3°52'	R	H1	12	35	50.11	55	57.5	—	—	43.5	21.5	17.7	13.8	11.4	9.94	9.07	0.49	
BG2.5-20R2	10		2	7°46'					50.46						21.5	17.3	13.0	10.6	9.14	8.27		
BG2.5-20L1	20	20	1	3°52'	L	H1	12	35	50.11	55	57.5	—	—	43.5	21.5	17.7	13.8	11.4	9.94	9.07	0.49	
BG2.5-20L2	10		2	7°46'					50.46						21.5	17.3	13.0	10.6	9.14	8.27		
CG2.5-20R1	20	20	1	3°52'	R	H1	12	35	50.11	55	57.5	—	—	43.5	12.9	10.6	8.30	6.83	5.97	5.44	0.40	
CG2.5-20R2	10	20	2	7°46'		H1	12	35	50.46	55	57.5	—	—	43.5	12.9	10.4	7.78	6.36	5.49	4.96	0.40	
CG2.5-30R1	30	30	1	3°52'	R	H1	12	40	75.17	80	82.5	—	—	56	27.3	22.8	18.0	15.1	13.2	12.0	0.82	
CG2.5-30R2	15	30	2	7°46'		H1	12	40	75.68	80	82.5	—	—	56	27.5	22.5	17.2	14.1	12.3	11.1	0.82	
CG2.5-40R1	40	40	1	3°52'	R	HB	15	45	100.23	105	107.5	(9)	(86)	68.5	46.7	39.0	31.3	26.5	23.3	21.2	1.02	
CG2.5-50R1	50	50	1	3°52'		R	HB	15	50	125.29	130	132.5	(110)	(110)	81	70.6	59.0	47.8	40.7	36.1	33.0	
CG2.5-50R2	25	50	2	7°46'	R		HB	15	50	126.16	130	132.5	(9)	(110)	81	71.1	58.6	46.4	38.6	33.6	30.7	1.46
CG2.5-60R1	60	60	1	3°52'		HB	15	55	150.34	155	157.5	(136)	(136)	93.5	98.8	82.9	67.3	57.6	51.5	47.0	1.93	
CG2.5-20L1	20	20	1	3°52'	L	H1	12	35	50.11	55	57.5	—	—	43.5	12.9	10.6	8.30	6.83	5.97	5.44	0.40	
CG2.5-20L2	10	20	2	7°46'		H1	12	35	50.46	55	57.5	—	—	43.5	12.9	10.4	7.78	6.36	5.49	4.96	0.40	
CG2.5-30L1	30	30	1	3°52'	L	H1	12	40	75.17	80	82.5	—	—	56	27.3	22.8	18.0	15.1	13.2	12.0	0.82	
CG2.5-30L2	15	30	2	7°46'		H1	12	40	75.68	80	82.5	—	—	56	27.5	22.5	17.2	14.1	12.3	11.1	0.82	
CG2.5-40L1	40	40	1	3°52'	L	HB	15	45	100.23	105	107.5	(9)	(86)	68.5	46.7	39.0	31.3	26.5	23.3	21.2	1.02	
CG2.5-50L1	50	50	1	3°52'		L	HB	15	50	125.29	130	132.5	(110)	(110)	81	70.6	59.0	47.8	40.7	36.1	33.0	
CG2.5-50L2	25	50	2	7°46'	L		HB	15	50	126.16	130	132.5	(9)	(110)	81	71.1	58.6	46.4	38.6	33.6	30.7	1.46
CG2.5-60L1	60	60	1	3°52'		HB	15	55	150.34	155	157.5	(136)	(136)	93.5	98.8	82.9	67.3	57.6	51.5	47.0	1.93	

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.

② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

Steel Worms

Newly added



W1K



Total length R	Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
63	5 x 2.3	M4	9	0.39	SW2.5-R1
	5 x 2.3	M4	9	0.39	● SW2.5-R1J15
	5 x 2.3	M4	9	0.37	● SW2.5-R1J16
63	5 x 2.3	M4	9	0.36	● SW2.5-R1J17
	5 x 2.3	M4	9	0.39	SW2.5-R2
	5 x 2.3	M4	9	0.39	● SW2.5-R2J15
63	5 x 2.3	M4	9	0.37	● SW2.5-R2J16
	5 x 2.3	M4	9	0.36	● SW2.5-R2J17
	5 x 2.3	M4	9	0.39	SW2.5-L1
63	5 x 2.3	M4	9	0.39	● SW2.5-L1J15
	5 x 2.3	M4	9	0.37	● SW2.5-L1J16
	5 x 2.3	M4	9	0.36	● SW2.5-L1J17
63	5 x 2.3	M4	9	0.39	SW2.5-L2
	5 x 2.3	M4	9	0.39	● SW2.5-L2J15
	5 x 2.3	M4	9	0.37	● SW2.5-L2J16
63	5 x 2.3	M4	9	0.36	● SW2.5-L2J17

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

[Caution on J series]

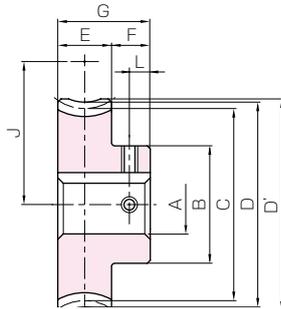
- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order**. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

BG • CG

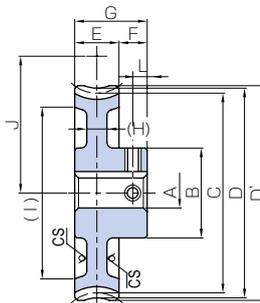


Bronze Worm Wheels & Gray Iron Worm Wheels

Newly added



H1K



HBK



To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7	* The product shapes of J Series items are identified by background color.													
Keyway Js9	12	14	15	16	17	18	19	20	22	25	28	30	32	35
Screw size	4 x 1.8	5 x 2.3				6 x 2.8				8 x 3.3		10 x 3.3		
Catalog No.	M4				M5				M6		M8			
BG2.5-20R1 J BORE														
BG2.5-20R2 J BORE														
BG2.5-20L1 J BORE														
BG2.5-20L2 J BORE														
CG2.5-20R1 J BORE														
CG2.5-20R2 J BORE														
CG2.5-30R1 J BORE														
CG2.5-30R2 J BORE														
CG2.5-40R1 J BORE														
CG2.5-50R1 J BORE														
CG2.5-50R2 J BORE														
CG2.5-60R1 J BORE														
CG2.5-20L1 J BORE														
CG2.5-20L2 J BORE														
CG2.5-30L1 J BORE														
CG2.5-30L2 J BORE														
CG2.5-40L1 J BORE														
CG2.5-50L1 J BORE														
CG2.5-50L2 J BORE														
CG2.5-60L1 J BORE														

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

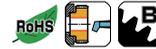
Other Products



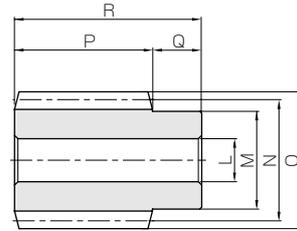
SW Steel Worms



Module 3



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W1

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						LH7	M	N	O	P	Q	Q'
SW3-R1 ● SW3-R1J17 ● SW3-R1J18 ● SW3-R1J19 ● SW3-R1J20	m3	1	3°55'	R	W1 W1K W1K W1K W1K	16	35	44	50	50	20	—
17												
SW3-R2 ● SW3-R2J17 ● SW3-R2J18 ● SW3-R2J19 ● SW3-R2J20		2	7°50'	R	W1 W1K W1K W1K W1K	16	35	44	50	50	20	—
17												
SW3-L1 ● SW3-L1J17 ● SW3-L1J18 ● SW3-L1J19 ● SW3-L1J20	m3	1	3°55'	L	W1 W1K W1K W1K W1K	16	35	44	50	50	20	—
17												
SW3-L2 ● SW3-L2J17 ● SW3-L2J18 ● SW3-L2J19 ● SW3-L2J20		2	7°50'	L	W1 W1K W1K W1K W1K	16	35	44	50	50	20	—
17												

[Caution on Product Characteristics]



BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels



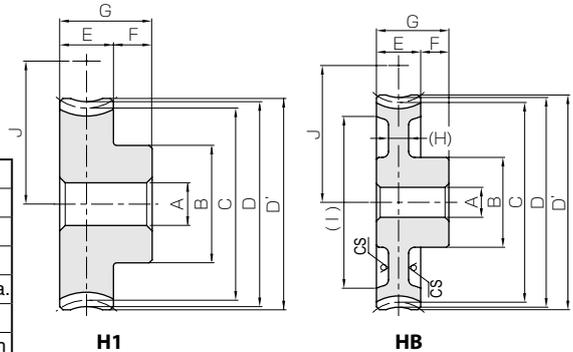
Module 3



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4 *	
Reference section of gear	Normal plane	
Gear teeth	Standard full depth	
Normal pressure angle	14° 30'	
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	
Tooth hardness	—	
Hub width (F)	15	
Screw offset (L)	7.5	

* The precision grade of J Series products is equivalent to the value shown in the table.

AH7	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
G	Total length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



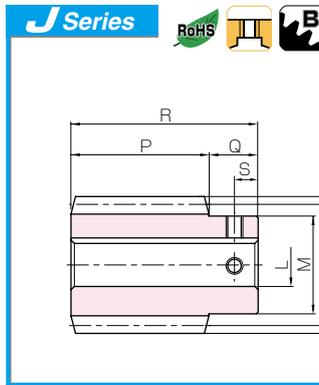
**CS has a sand mold casting finish.

NOTE 1 : Allowable torque for worm revolution (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle Hand thread	Shape	AH7	B	C	D	D'	E	G	(H)	(I)	J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)
																30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm		
BG3-20R1 BG3-20R2	20 10	20	1 2	3°55' 7°50'	R	H1	50	60.14 60.57	66	69	28	43	—	—	52	36.8 37.0	30.1 29.5	23.5 22.1	19.1 17.9	16.7 15.4	15.2 14.0	0.89	
BG3-20L1 BG3-20L2	20 10							1 2								3°55' 7°50'	L	60.14 60.57	36.8 37.0	30.1 29.5	23.5 22.1		19.1 17.9
CG3-20R1 CG3-20R2 CG3-30R1 CG3-30R2 CG3-40R1	20 10 30 15 40	20 20 30 30 40	2 2 2 2 1	3°55' 7°50' 3°55' 7°50' 3°55'	R	H1 H1 H1 H1 HB	50 50 55 55 55	60.14 60.57 90.21 90.85 120.28	66 66 96 96 126	69 69 99 99 129	28 28 28 28 30	43 43 43 43 45	— — — — (9)	— — — — (107)	52 52 67 67 82	22.1 22.2 46.6 47.2 79.8	18.1 17.7 38.7 38.5 66.3	14.1 13.3 30.6 29.3 53.2	11.5 10.7 25.4 23.7 44.6	10.0 9.24 22.2 20.8 39.1	0.15~0.33	0.73 0.73 1.50 1.50 1.79	
CG3-50R1 CG3-50R2 CG3-60R1	50 25 60	50 50 60	1 2 1	3°55' 7°50' 3°55'	HB	20	63 63 70	150.35 151.41 180.42	156 156 186	159 159 189	30	45	(9)	(138) (138) (166)	97 97 112	121 122 169	100 100 141	81.1 79.1 114	68.4 65.1 96.7	60.5 56.7 86.3		2.50 2.50 3.40	
CG3-20L1 CG3-20L2 CG3-30L1 CG3-30L2 CG3-40L1	20 10 30 15 40	20 20 30 30 40	2 2 1 2 1	3°55' 7°50' 3°55' 7°50' 3°55'	L	H1 H1 H1 H1 HB	50 50 55 55 55	60.14 60.57 90.21 90.85 120.28	66 66 96 96 126	69 69 99 99 129	28 28 28 28 30	43 43 43 43 45	— — — — (9)	— — — — (107)	52 52 67 67 82	22.1 22.2 46.6 47.2 79.8	18.1 17.7 38.7 38.5 66.3	14.1 13.3 30.6 29.3 53.2	11.5 10.7 25.4 23.7 44.6	10.0 9.24 22.2 20.8 39.1	0.73 0.73 1.50 1.50 1.79		
CG3-50L1 CG3-50L2 CG3-60L1	50 25 60	50 50 60	1 2 1	3°55' 7°50' 3°55'	HB	20	63 63 70	150.35 151.41 180.42	156 156 186	159 159 189	30	45	(9)	(138) (138) (166)	97 97 112	121 122 169	100 100 141	81.1 79.1 114	68.4 65.1 96.7	60.5 56.7 86.3	2.50 2.50 3.40		

[Caution on Product Characteristics]

- Worm Wheels are profile shifted to create the proper center distance.
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.



Steel Worms
Newly added



W1K

Total length R	Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
70	—	—	—	0.64	SW3-R1
	5 x 2.3	M4	10	0.62	● SW3-R1J17
	6 x 2.8	M5	10	0.60	● SW3-R1J18
	6 x 2.8	M5	10	0.58	● SW3-R1J19
	6 x 2.8	M5	10	0.56	● SW3-R1J20
70	—	—	—	0.64	SW3-R2
	5 x 2.3	M4	10	0.62	● SW3-R2J17
	6 x 2.8	M5	10	0.60	● SW3-R2J18
	6 x 2.8	M5	10	0.58	● SW3-R2J19
	6 x 2.8	M5	10	0.56	● SW3-R2J20
70	—	—	—	0.64	SW3-L1
	5 x 2.3	M4	10	0.62	● SW3-L1J17
	6 x 2.8	M5	10	0.60	● SW3-L1J18
	6 x 2.8	M5	10	0.58	● SW3-L1J19
	6 x 2.8	M5	10	0.56	● SW3-L1J20
70	—	—	—	0.64	SW3-L2
	5 x 2.3	M4	10	0.62	● SW3-L2J17
	6 x 2.8	M5	10	0.60	● SW3-L2J18
	6 x 2.8	M5	10	0.58	● SW3-L2J19
	6 x 2.8	M5	10	0.56	● SW3-L2J20

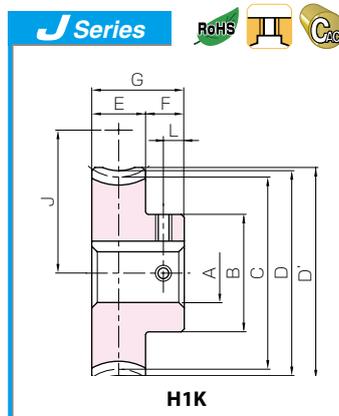
[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG



Bronze Worm Wheels & Gray Iron Worm Wheels
Newly added



H1K

HBK

To order J Series products, please specify; Catalog No. + J + BORE

Bore H7	* The product shapes of J Series items are identified by background color.							
Keyway Js9	20	22	25	28	30	32	35	40
Screw size	6 x 2.8			8 x 3.3		10 x 3.3		12 x 3.3
Catalog No.	M5		M6			M8		
BG3-20R1 J BORE								
BG3-20R2 J BORE								
BG3-20L1 J BORE								
BG3-20L2 J BORE								
CG3-20R1 J BORE								
CG3-20R2 J BORE								
CG3-30R1 J BORE								
CG3-30R2 J BORE								
CG3-40R1 J BORE								
CG3-50R1 J BORE								
CG3-50R2 J BORE								
CG3-60R1 J BORE								
CG3-20L1 J BORE								
CG3-20L2 J BORE								
CG3-30L1 J BORE								
CG3-30L2 J BORE								
CG3-40L1 J BORE								
CG3-50L1 J BORE								
CG3-50L2 J BORE								
CG3-60L1 J BORE								

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are con-ter-bored to reduce the length of the tap.
- ⑤ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



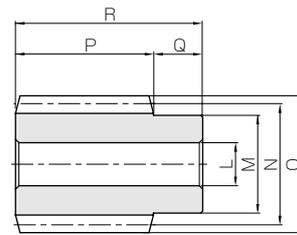
SW Steel Worms



Module 4



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W1

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M	N	O	P	Q	Q'
SW4-R1	m4	1	3°42'	R	W1	22	50	62	70	70	25	—
SW4-R2		2	7°25'	R	W1	22	50	62	70	70	25	—
SW4-L1	m4	1	3°42'	L	W1	22	50	62	70	70	25	—
SW4-L2		2	7°25'	L	W1	22	50	62	70	70	25	—

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.

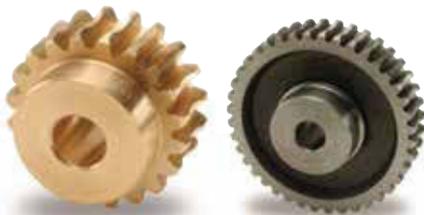
* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.



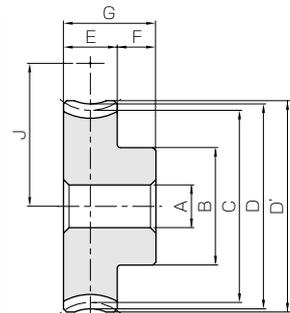
BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels



Module 4



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	14° 30'	14° 30'
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth ardnness	—	—



H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
BG4-20R1	20	m4	20	1	3°42'	R	H1	20	60	80.17	88	90	35
BG4-20R2	10		20	2	7°25'	R	H1	20	60	80.67	88	90	35
BG4-20L1	20		20	1	3°42'	L	H1	20	60	80.17	88	90	35
BG4-20L2	10		20	2	7°25'	L	H1	20	60	80.67	88	90	35

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
CG4-20R1	20	m4	20	1	3°42'	R	H1	20	60	80.17	88	90	35
CG4-20R2	10		20	2	7°25'	R	H1	20	60	80.67	88	90	35
CG4-30R1	30		30	1	3°42'	R	HB	20	60	120.25	128	130	35
CG4-30R2	15		30	2	7°25'	R	HB	20	60	121.01	128	130	35
CG4-40R1	40		40	1	3°42'	R	HB	20	70	160.33	168	171	35
CG4-50R1	50		50	1	3°42'	R	H2	20	70	200.42	208	211	35
CG4-50R2	25		50	2	7°25'	R	H2	20	70	201.69	208	211	35
CG4-60R1	60		60	1	3°42'	R	H2	20	80	240.5	248	251	35
CG4-20L1	20		20	1	3°42'	L	H1	20	60	80.17	88	90	35
CG4-20L2	10		20	2	7°25'	L	H1	20	60	80.67	88	90	35
CG4-30L1	30		30	1	3°42'	L	HB	20	60	120.25	128	130	35
CG4-30L2	15		30	2	7°25'	L	HB	20	60	120.01	128	130	35
CG4-40L1	40		40	1	3°42'	L	HB	20	70	160.33	168	171	35
CG4-50L1	50		50	1	3°42'	L	H2	20	70	200.42	208	211	35
CG4-50L2	25		50	2	7°25'	L	H2	20	70	201.69	208	211	35
CG4-60L1	60		60	1	3°42'	L	H2	20	80	240.5	248	251	35

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.

② H2 Shape Worm Gears have elongated casting holes in the web (H).

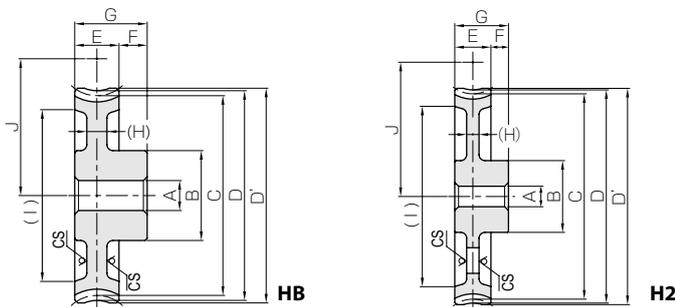
③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

Total length R	Set Screw		Weight (kg)	Catalog No.
	Size	S		
95	—	—	1.76	SW4-R1
95	—	—	1.76	SW4-R2
95	—	—	1.76	SW4-L1
95	—	—	1.76	SW4-L2

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



* CS has a sand mold casting finish.

NOTE 1 : Allowable torque for worm revolution (rpm)



Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			
17	52	71	75.9	61.7	47.9	38.4	33.7	30.1	0.17~0.37	1.91	BG4-20R1
17	52	71	75.9	60.0	44.8	35.7	30.9	27.5	0.17~0.37	1.91	BG4-20R2
17	52	71	75.9	61.7	47.9	38.4	33.7	30.1	0.17~0.37	1.91	BG4-20L1
17	52	71	75.9	60.0	44.8	35.7	30.9	27.5	0.17~0.37	1.91	BG4-20L2

NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1				Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm			
17	52	—	—	71	45.6	37.0	28.7	23.0	0.17~0.37	1.56	CG4-20R1
17	52	—	—	71	45.5	36.0	26.9	21.4	0.17~0.37	1.56	CG4-20R2
17	52	(12)	(96)	91	96.3	79.1	62.3	50.9	0.17~0.37	2.52	CG4-30R1
17	52	(12)	(96)	91	96.8	78.3	59.4	47.3	0.17~0.37	2.52	CG4-30R2
17	52	(11)	(136)	111	165	136	108	89.4	0.17~0.37	3.81	CG4-40R1
17	52	(12)	(176)	131	249	205	165	137	0.17~0.37	4.78	CG4-50R1
17	52	(12)	(176)	131	250	204	160	130	0.17~0.37	4.78	CG4-50R2
17	52	(12)	(218)	151	348	288	233	194	0.17~0.37	6.36	CG4-60R1
17	52	—	—	71	45.6	37.0	28.7	23.0	0.17~0.37	1.56	CG4-20L1
17	52	—	—	71	45.5	36.0	26.9	21.4	0.17~0.37	1.56	CG4-20L2
17	52	(12)	(96)	91	96.3	79.1	62.3	50.9	0.17~0.37	2.52	CG4-30L1
17	52	(12)	(96)	91	96.8	78.3	59.4	47.3	0.17~0.37	2.52	CG4-30L2
17	52	(11)	(136)	111	165	136	108	89.4	0.17~0.37	3.81	CG4-40L1
17	52	(12)	(176)	131	249	205	165	137	0.17~0.37	4.78	CG4-50L1
17	52	(12)	(176)	131	250	204	160	130	0.17~0.37	4.78	CG4-50L2
17	52	(12)	(218)	151	348	288	233	194	0.17~0.37	6.36	CG4-60L1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



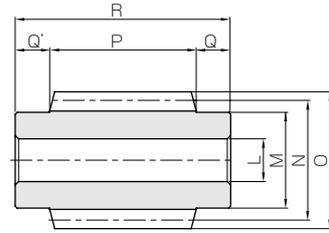
SW Steel Worms



Module 5, 6



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)



W3

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M	N	O	P	Q	Q'
SW5-R1	m5	1	4°06'	R	W3	25	56	70	80	85	20	20
SW5-R2		2	8°13'	R	W3	25	56	70	80	85	20	20
SW6-R1	m6	1	4°18'	R	W3	30	64	80	92	100	25	25
SW6-R2		2	8°38'	R	W3	30	64	80	92	100	25	25

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.



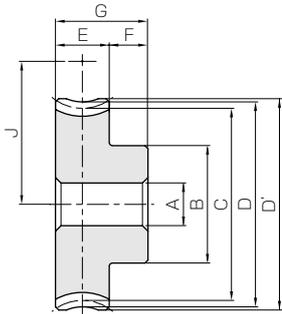
BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels



Module 5, 6



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	14° 30'	14° 30'
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth hardness	—	—



H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
BG5-20R1	20	m5	20	1	4°06'	R	H1	22	75	100.26	110	113	45
BG5-20R2	10		20	2	8°13'	R	H1	22	75	101.04	110	113	45
BG6-20R1	20	m6	20	1	4°18'	R	H1	25	100	120.34	132	136	52
BG6-20R2	10		20	2	8°38'	R	H1	25	100	121.38	132	136	52

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
CG5-20R1	20	m5	20	1	4°06'	R	H1	22	75	100.26	110	113	45
CG5-20R2	10		20	2	8°13'	R	H1	22	75	101.04	110	113	45
CG5-30R1	30		30	1	4°06'	R	HB	22	75	150.38	160	163	45
CG5-30R2	15		30	2	8°13'	R	HB	22	75	151.56	160	163	45
CG5-40R1	40		40	1	4°06'	R	H2	22	90	200.51	210	213	45
CG5-50R1	50		50	1	4°06'	R	H2	22	90	250.61	260	263	45
CG5-50R2	25	50	2	8°13'	R	H2	22	90	252.59	260	263	45	
CG5-60R1	60	60	1	4°06'	R	H2	22	100	300.77	310	313	45	
CG6-20R1	20	m6	20	1	4°18'	R	H1	25	100	120.34	132	136	52
CG6-20R2	10		20	2	8°38'	R	H1	25	100	121.38	132	136	52
CG6-30R1	30		30	1	4°18'	R	HB	25	100	180.51	192	196	52
CG6-30R2	15		30	2	8°38'	R	HB	25	100	182.06	192	196	52
CG6-40R1	40		40	1	4°18'	R	H2	25	100	240.68	252	256	52
CG6-50R1	50		50	1	4°18'	R	H2	25	100	300.85	312	316	52
CG6-50R2	25	50	2	8°38'	R	H2	25	100	303.44	312	316	52	
CG6-60R1	60	60	1	4°18'	R	H2	25	120	361.02	372	376	52	

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.

② H2 Shape Worm Gears have elongated casting holes in the web (H).

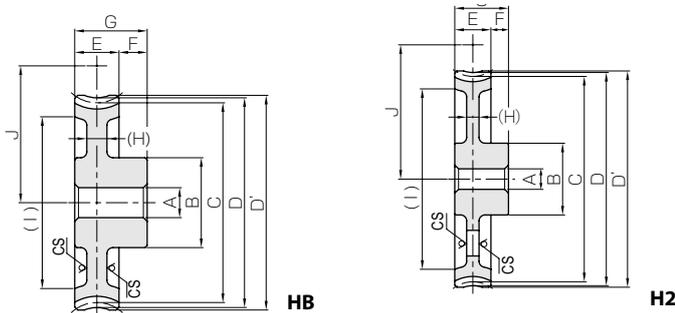
③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

Total length R	Set Screw		Weight (kg)	Catalog No.
	Size	S		
125	—	—	2.86	SW5-R1
125	—	—	2.86	SW5-R2
150	—	—	4.38	SW6-R1
150	—	—	4.38	SW6-R2

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



* CS has a sand mold casting finish.

NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			
20	65	85	146	117	91.2	73.0	63.7	56.9	0.20~0.40	3.89	BG5-20R1
20	65	85	146	115	85.8	68.4	58.8	52.2	0.20~0.40	3.89	BG5-20R2
20	72	100	232	185	144	115	99.2	88.8	0.22~0.42	6.60	BG6-20R1
20	72	100	235	183	136	109	92.3	82.0	0.22~0.42	6.60	BG6-20R2

NOTE 1 : Allowable torque for worm revolution (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1				Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm			
20	65	—	—	85	87.4	70.3	54.7	43.8	0.20~0.40	3.18	CG5-20R1
20	65	—	—	85	87.9	68.9	51.5	41.0	0.20~0.40	3.18	CG5-20R2
20	65	(13)	(127)	110	185	150	119	96.8	0.20~0.40	4.78	CG5-30R1
20	65	(13)	(127)	110	187	150	114	90.6	0.20~0.40	4.78	CG5-30R2
20	65	(16)	(172)	135	316	258	206	170	0.20~0.40	7.44	CG5-40R1
20	65	(16)	(223)	160	477	390	315	261	0.20~0.40	9.79	CG5-50R1
20	65	(16)	(223)	160	483	390	307	249	0.20~0.40	9.79	CG5-50R2
20	65	(13)	(276)	185	668	548	443	369	0.20~0.40	12.0	CG5-60R1
20	72	—	—	100	139	111	86.2	—	0.22~0.42	5.39	CG6-20R1
20	72	—	—	100	141	110	81.8	—	0.22~0.42	5.39	CG6-20R2
20	72	(15)	(155)	130	294	237	187	—	0.22~0.42	8.28	CG6-30R1
20	72	(15)	(155)	130	299	238	181	—	0.22~0.42	8.28	CG6-30R2
20	72	(15)	(213)	160	502	407	325	—	0.22~0.42	10.9	CG6-40R1
20	72	(16)	(275)	190	760	615	496	—	0.22~0.42	14.0	CG6-50R1
20	72	(16)	(275)	190	774	620	488	—	0.22~0.42	14.0	CG6-50R2
20	72	(17)	(336)	220	1060	865	698	—	0.22~0.42	19.8	CG6-60R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



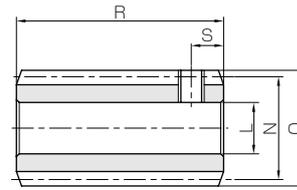
SUW Stainless Steel Worms



Module 0.5, 0.8



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	(less than 187HB)



W2

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _{H8}	M	N	O	P	Q	R
SUW0.5-R1	m0.5	1	2°36'	R	W2	5	—	11	12	—	—	18
SUW0.5-R2		2	5°13'	R	W2	5	—	11	12	—	—	18
SUW0.8-R1	m0.8	1	3°17'	R	W2	6	—	14	15.6	—	—	30
SUW0.8-R2		2	6°34'	R	W2	6	—	14	15.6	—	—	30

[Caution on Product Characteristics]

- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- These worms produce axial thrust forces. See Page 344 for more details.

* For products not categorized in our KHK Stock Gear series, custom gear production services with **short lead times** is available. For details see Page 8.



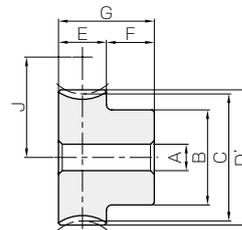
DG Plastic Worm Wheels



Module 0.5, 0.8



Specifications	
Precision grade	KHK W 002 grade 5
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	Polyacetal
Heat treatment	—
Tooth hardness	—



HA

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A ^{-0.05} / _{-0.10}	B	C	D	D'	E
DG0.5-20R1	20	m0.5	20	1	2°36'	R	HA	4	9	10.01	—	11	5
DG0.5-20R2	10		20	2	5°13'	R	HA	4	9	10.04	—	11	5
DG0.5-30R1	30		30	1	2°36'	R	HA	4	12	15.02	—	16	5
DG0.5-30R2	15		30	2	5°13'	R	HA	4	12	15.06	—	16	5
DG0.5-40R1	40		40	1	2°36'	R	HA	5	15	20.02	—	21	5
DG0.5-50R1	50		50	1	2°36'	R	HA	5	20	25.03	—	26	5
DG0.5-60R1	60	60	1	2°36'	R	HA	5	25	30.03	—	31	5	
DG0.8-20R1	20	m0.8	20	1	3°17'	R	HA	5	12	16.03	—	17.6	9
DG0.8-20R2	10		20	2	6°34'	R	HA	5	12	16.11	—	17.6	9
DG0.8-30R1	30		30	1	3°17'	R	HA	5	18	24.04	—	25.6	9
DG0.8-30R2	15		30	2	6°34'	R	HA	5	18	24.16	—	25.6	9
DG0.8-40R1	40		40	1	3°17'	R	HA	6	20	32.05	—	33.6	9
DG0.8-50R1	50		50	1	3°17'	R	HA	8	25	40.07	—	41.6	9
DG0.8-60R1	60	60	1	3°17'	R	HA	8	25	48.08	—	49.6	9	

[Caution on Product Characteristics]

- Worm Wheels are profile shifted to create the proper center distance.
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.
- Since the bore is finished with a minus tolerance, you can use a shaft with a force fit.

Set Screw		Weight (kg)	Catalog No.
Size	S		
M3	3	0.010	SUW0.5-R1
M3	3	0.010	SUW0.5-R2
M4	5	0.029	SUW0.8-R1
M4	5	0.029	SUW0.8-R2

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur
GearsHelical
GearsInternal
Gears

Racks

CP Racks
& PinionsMiter
GearsBevel
GearsScrew
GearsWorm
Gear PairBevel
GearboxesOther
Products

DG

Plastic Worm Wheels



Hub width F	Total length G	Mounting distance J	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (g)	Catalog No.
			Bending strength	Bending strength			
7	12	10.5	0.067	0.0068	0~0.16	1.01	DG0.5-20R1
7	12	10.5	0.067	0.0069	0~0.16	1.01	DG0.5-20R2
7	12	13	0.11	0.011	0~0.16	2.21	DG0.5-30R1
7	12	13	0.11	0.011	0~0.16	2.21	DG0.5-30R2
7	12	15.5	0.16	0.016	0~0.16	3.72	DG0.5-40R1
7	12	18	0.21	0.022	0~0.16	6.36	DG0.5-50R1
7	12	20.5	0.26	0.027	0~0.16	9.67	DG0.5-60R1
9	18	15	0.31	0.031	0.04~0.22	3.73	DG0.8-20R1
9	18	15	0.31	0.032	0.04~0.22	3.73	DG0.8-20R2
9	18	19	0.52	0.053	0.04~0.22	8.84	DG0.8-30R1
9	18	19	0.52	0.053	0.04~0.22	8.84	DG0.8-30R2
9	18	23	0.74	0.076	0.04~0.22	14.0	DG0.8-40R1
9	18	27	0.98	0.10	0.04~0.22	21.6	DG0.8-50R1
9	18	31	1.21	0.12	0.04~0.22	28.8	DG0.8-60R1

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



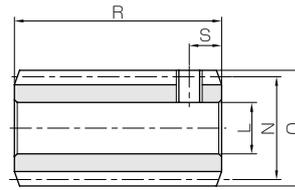
SUW Stainless Steel Worms



Module 1、 1.5



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	(less than 187HB)



W2

* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Norma module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						LH7 (H8)	M	N	O	P	Q	R
SUW1-R1 SUW1-R2	m1	1 2	3°35' 7°11'	R R	W2 W2	6 6	— —	16 16	18 18	— —	— —	32 32
SUW1.5-R1 ● SUW1.5-R1J8 ● SUW1.5-R1J10	m1.5	1	3°26'	R	W1 W1T W1K	8 8 10	20	25	28	30	10	40
SUW1.5-R2 ● SUW1.5-R2J8 ● SUW1.5-R2J10		2	6°54'	R	W1 W1T W1K	8 8 10	20	25	28	30	10	40

[Caution on Product Characteristics]

- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- These worms produce axial thrust forces. See Page 344 for more details.



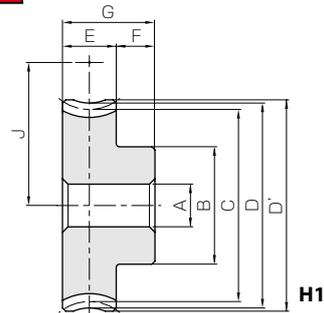
PG Plastic Worm Wheels



Module 1、 1.5



Specifications		
Precision grade	KHK W 002 grade 5 *	
Reference section of gear	Normal plane	
Gear teeth	Standard full depth	
Normal pressure angle	20°	
Material	MC901 Nylon	
Heat treatment	—	
Tooth hardness	—	
Module	m1	m1.5
Face width (E)	10	12
Hub width (F)	10	10
Total length (G)	20	22
Screw offset (L)	5	5



* The precision grade of this product is equivalent to the value shown in the table.

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Mounting distance	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)
						A	B	C	D	D'	J	Bending strength	Bending strength		
PG1-20R1	20	20	1	3°35'	R H1	6	16	20.04	22	23	18	0.62	0.060	0~0.28	0.0058
PG1-20R2	10	20	2	7°11'	R H1	6	16	20.16	22	23	18	0.62	0.060	0~0.28	0.0058
PG1-30R1	30	30	1	3°35'	R H1	6	20	30.06	32	33	23	1.03	0.10	0~0.28	0.012
PG1-40R1	40	40	1	3°35'	R H1	8	26	40.08	42	43	28	1.49	0.15	0~0.28	0.021
PG1-50R1	50	50	1	3°35'	R H1	8	30	50.1	52	53	33	1.96	0.20	0~0.28	0.031
PG1.5-20R1	20	20	1	3°26'	R H1	8	22	30.05	33	34.5	27.5	1.66	0.17	0~0.30	0.014
PG1.5-20R2	10	20	2	6°54'	R H1	8	22	30.22	33	34.5	27.5	1.68	0.17	0~0.30	0.014

[Caution on Product Characteristics]

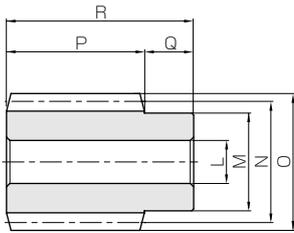
- Worm Wheels are profile shifted to create the proper center distance.
- Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), teeth diameter, and backlash. Please see the section "Design of Plastic Gears" in separate technical reference book (Page 101).
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 342 for more details.

[Caution on Secondary Operations]

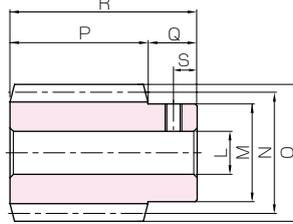
- Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



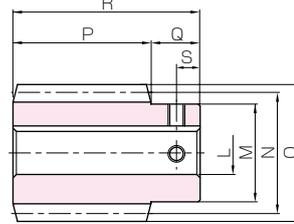
Stainless Steel Worms



W1



W1T



W1K



Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	S		
—	M4	5	0.042	SUW1-R1 SUW1-R2
—	M4	5	0.042	
—	—	—	0.12	SUW1.5-R1 ● SUW1.5-R1J8 ● SUW1.5-R1J10
4 x 1.8	M5	5	0.12	
—	M4	5	0.11	SUW1.5-R2 ● SUW1.5-R2J8 ● SUW1.5-R2J10
4 x 1.8	M5	5	0.12	
—	M4	5	0.11	

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

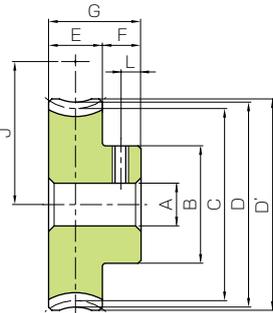
CP Racks & Pinions

PG

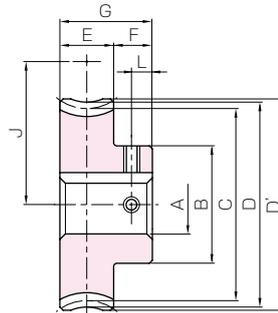


Plastic Worm Wheels

Newly added



H1T



H1K



Bore	* The product shapes of J Series items are identified by background color.							
Keyway Js9	6	8	10	12	14	15	16	17
Screw size	—			4 x 1.8		5 x 2.3		
Catalog No.	M4	M5	M4					
PG1-20R1 J BORE								
PG1-20R2 J BORE								
PG1-30R1 J BORE								
PG1-40R1 J BORE								
PG1-50R1 J BORE								
PG1.5-20R1 J BORE								
PG1.5-20R2 J BORE								

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ The use of H1T shaped Set Screws for fastening gears to a shaft is a method only applicable to the usage for light loads. For secure fastening, please use dowel pins in combination.

To order J Series products, please specify; Catalog No. + J + BORE

* In regards to MC Nylon gears, other materials are available for plastic gears, including Ultra High Molecular Weight Polyethylene (UHMW-PE), which has excellent abrasion resistance. Poly Ether Ether Ketone (PEEK) also has quality properties. A single piece order is acceptable and will be produced as a custom-made gear. For details on quotations and orders please see Page 8.

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



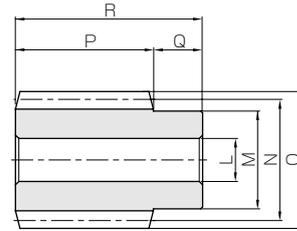
SUW Stainless Steel Worms



Module 2, 2.5, 3



Specifications			
Precision grade	KHK W 001 grade 4 *		
Reference section of gear	Normal plane		
Gear teeth	Standard full depth		
Material	SUS303		
Heat treatment	—		
Tooth hardness	(less than 187HB)		
Module	m2	m2.5	m3
Normal pressure angle	14° 30'	20°	14° 30'
Screw offset (S)	7	9	10



W1

* The precision grade of J Series products is equivalent to the value shown in the table.
* The pressure angle is at 20 degrees for module 2.5.

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Weight
						LH7	M	N	O	P	Q	R	(kg)
SUW2-R1	m2	1	3°42'	R	W1	12	25	31	35	32	14	46	0.20
SUW2-R2		2	7°25'			12	25	31	35	32	14	46	0.20
SUW2.5-R1	m2.5	1	3°52'			15	30	37	42	45	18	63	0.39
SUW2.5-R2		2	7°46'			15	30	37	42	45	18	63	0.39
SUW3-R1	m3	1	3°55'			16	35	44	50	50	20	70	0.63
SUW3-R2		2	7°50'			16	35	44	50	50	20	70	0.63

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 344 for more details.



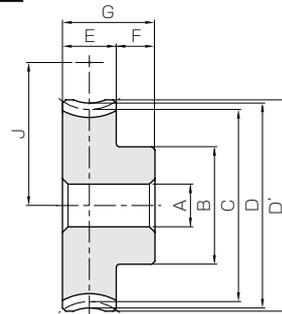
PG Plastic Worm Wheels



Module 2, 2.5, 3



Specifications			
Precision grade	KHK W 002 grade 5 *		
Reference section of gear	Normal plane		
Gear teeth	Standard full depth		
Material	MC901 Nylon		
Heat treatment	—		
Tooth hardness	—		
Module	m2	m2.5	m3
Normal pressure angle	14° 30'	20°	14° 30'
Face width (E)	22	22	28
Hub width (F)	13	14	15
Total length (G)	35	36	43
Screw offset (L)	6.5	7	7.5



H1

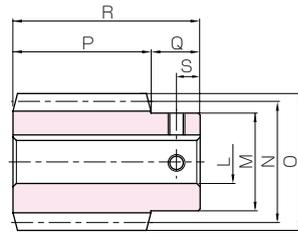
* The precision grade of this product is equivalent to the value shown in the table.

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Mounting distance	Allowable torque (N·m)	Allowable torque (kg·m)	Backlash	Weight
							A	B	C	D	D'	J	Bending strength	Bending strength	(mm)	(kg)
PG2-20R1	20	20	1	3°42'	R	H1	10	33	40.08	44	46	35.5	4.78	0.49	0~0.33	0.046
PG2-20R2	10		2	7°25'			10	33	40.34	44	46	35.5	4.82	0.49	0~0.33	0.046
PG2.5-20R1	20		1	3°52'			12	35	50.11	55	57.5	43.5	(8.46)	0.86	0~0.36	0.066
PG2.5-20R2	10		2	7°46'			12	35	50.46	55	57.5	43.5	(8.54)	0.87	0~0.36	0.066
PG3-20R1	20		1	3°55'			15	50	60.14	66	69	52	(13.7)	1.40	0~0.38	0.13
PG3-20R2	10		2	7°50'			15	50	60.57	66	69	52	(13.8)	1.41	0~0.38	0.13

- [Caution on Product Characteristics]
- ① Worm Wheels are profile shifted to create the proper center distance.
 - ② Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), teeth diameter, and backlash. Please see the section "Design of Plastic Gears" in separate technical reference book (Page 101).
 - ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Usage above the value in brackets will exceed the maximum allowable sliding speed, if no lubrication is applied. So, lubrication is required. Please see Page 342 for more details.

Stainless Steel Worms

Newly added



W1K



To order J Series products, please specify; Catalog No. + J + BORE

Bore H7	* The product shapes of J Series items are identified by background color.							
Keyway Js9	12	14	15	16	17	18	19	20
Screw size	4 x 1.8	5 x 2.3			6 x 2.8			
Catalog No.	M4				M5			
SUW2-R1 BORE								
SUW2-R2 BORE								
SUW2.5-R1 BORE								
SUW2.5-R2 BORE								
SUW3-R1 BORE								
SUW3-R2 BORE								

[Caution on J series]

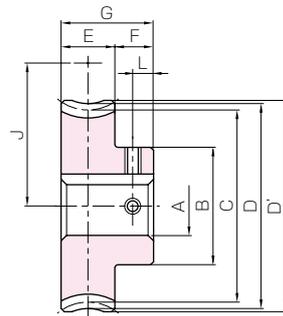
- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered)**, after placing an order.
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
- ④ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

PG

Plastic Worm Wheels

Newly added



H1K



To order J Series products, please specify; Catalog No. + J + BORE

Bore	* The product shapes of J Series items are identified by background color.												
Keyway Js9	10	12	14	15	16	17	18	19	20	22	25	28	30
Screw size	4 x 1.8	5 x 2.3			6 x 2.8				8 x 3.3				
Catalog No.	M4				M5				M6				
PG2-20R1 J BORE													
PG2-20R2 J BORE													
PG2.5-20R1 J BORE													
PG2.5-20R2 J BORE													
PG3-20R1 J BORE													
PG3-20R2 J BORE													

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 344) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 - ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered)**, after placing an order.
Please allow additional shipping time to get to your local distributor.
 - ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
 - ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
 - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap.
 - ⑤ For products having a tapped hole, a set screw is included.

Spur Gears
Helical Gears
Internal Gears
Racks
CP Racks & Pinions
Miter Gears
Bevel Gears
Screw Gears
Worm Gear Pair
Bevel Gearboxes
Other Products

Autorisierter Händler | Distributeur autorisé | Distributore autorizzato | Authorized distributor



H. FRÖHLICH AG | INDUSTRIE TECHNIK

Widenholzstrasse 1
CH-8304 Wallisellen
Tel. +41 44 527 20 00
Fax +41 44 527 20 19
info@hfag.ch | www.hfag.ch